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The

# BLUE JAY

A JOURNAL OF NATURAL HISTORY AND CONSERVATION  
FOR SASKATCHEWAN AND ADJACENT REGIONS

Vol. XXX, No. 4

Regina, Saskatchewan

December, 1972



Franklin's Ground Squirrel

Photo by H. H. Pittman, Wauchope

Published quarterly by the  
SASKATCHEWAN NATURAL HISTORY SOCIETY  
Regina, Saskatchewan



## BLUE JAY POLICY

With this issue of the *Blue Jay* I resign an editorship which has been continuous since January, 1956, except for an 18-month period (1965-66) when R. W. Nero replaced me. It has been a pleasure working for the society in this capacity but now I am looking forward to a period of extensive travel and an increased amount of time for study and research.

During the past few years I have been constantly frustrated by the fact that I could not give as much time to the *Blue Jay* as it deserved. It seems appropriate, therefore, at this time to thank the many contributors and correspondents of the *Blue Jay* for their tolerance and understanding of my editorial problems and to make a general explanation of the editorial policy which I have tried to follow. I should like also to thank the many people who have helped with the editing, typing and proof reading of the magazine. Though I take full responsibility for any errors which have appeared on *Blue Jay* pages, I recognize that the conscientious work both of my assistants and of the contributors themselves has led to the publication of an increasingly worthwhile and readable magazine.

When the *Blue Jay* began, it was the idea of the founder, Mrs. I. M. Priestly, that the magazine would (like Sammy Jay in the Burgess stories) be a news carrier. If a person had some nature news to share, he sent it to the *Blue Jay*. Over the years our membership has grown and the magazine has become widely read far beyond the boundaries of our province. In other words, it has gradually become evident that the *Blue Jay* has two functions: the recording of observations by contributors and the providing of information about nature for the reader.

The editor's first responsibility is to select from the material contributed those items which he considers of most interest to the greatest number of readers. Experience has proven that, generally speaking, most people have an interest in birds and certainly the greatest number of contributions published have been on the topic of birds. We have also tried, however, to have reports on a diversity of topics and for this reason I have tended to favour many items which do not feature birds and have even written a number of such items myself.

Though most of the articles to date have been bird, or plant or insect oriented, I hope that the *Blue Jay* will eventually become a true natural history magazine. No organism lives in isolation. True, we must first know what kinds of birds, plants or insects live in our area and for that reason our magazine must contain fact-containing lists and data, but as we become better naturalists we should consider inter-relationships between different organisms and we should become knowledgeable about the habitat requirements of each organism. We must understand what forms of nature live in our area and what their habitat requirements are in order to assess the problems which currently face us.

It seems to me that since we are in the midst of an environmental crisis, it is the responsibility of magazines such as the *Blue Jay* to examine and report on the environmental impact of all projects envisioned by man so that our members can both understand the long-term effects of these on nature and also, individually and as a group, exert some pressure on governments to conserve our human environment. I agree with R. Dasmann in *Destruction of California* when he says: "My definition of conservation includes the ecology of man's environment and the social organizations that he uses to achieve a state of well-being within that environment. Conservation problems thus range from city organization to the preservation of wilderness areas. To me they cannot be dissociated. We cannot save a wilderness or a wild species without paying attention to the problems of life in the cities; we cannot have a satisfactory life in a city without wild country and wildlife accessible on the horizon. We cannot plan for land and resources without consideration of human population problems." It is my belief, then, that the *Blue Jay* must emphasize both the specific and the general and that worthwhile articles dealing with any aspect of the natural world should be considered for publication.

At the moment of going to press the new editor of the *Blue Jay* has been named; he is V. Bernard Gollop of Saskatoon. We wish him well in his undertaking.



# SASKATCHEWAN NATURAL HISTORY SOCIETY

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Please remember that if you are interested in nature, in the preservation of natural areas, and in environmental quality, we need your membership and financial support. We need not only your membership but your letters and ideas. We also need you to interest *others* in joining the number of those who are becoming increasingly disturbed by the deterioration of our environment.

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# HAROLD HERBERT PITTMAN, 1889-1972

## A MEMORIAL TRIBUTE

by **C. Stuart Houston**, 863 University Drive, Saskatoon

Harold Herbert Pittman died on August 29, 1972 in the Regina General Hospital after a lengthy illness. He will be known to some readers from three early articles in the *Blue Jay*, and the brief summary of his field records in Nero's *Birds of Moose Mountain, Saskatchewan* — yet few people in Saskatchewan appreciated the extent of his writings or the pre-eminence of his nature photography. He was undoubtedly one of the most knowledgeable, all-round naturalists to live in Saskatchewan. Though birds were only one of his interests, his incomplete field notebooks recorded breeding records of 74 Saskatchewan species within a few miles of Wauchope.

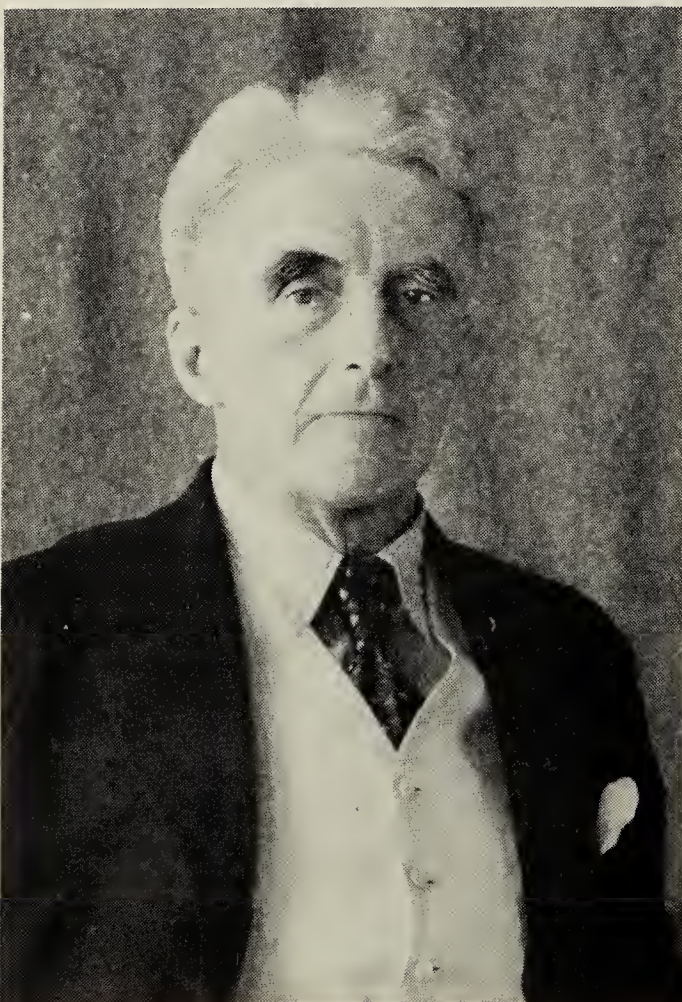
H. H. Pittman was born in London, England in June, 1889, the son of John and Clara (Wakelin) Pittman. He was

educated at King's College School on the Strand. He made his first visit to relatives near Wauchope, Saskatchewan in 1905 at the age of 16, and at once decided that this was the best place in the world to pursue his hobby of studying and photographing nature. He returned to Canada on visits in 1907 and 1912 and emigrated permanently in 1913. Throughout his lifetime, no matter how difficult the times, nature study and photography were his quiet, solitary and almost all-consuming hobbies.

He homesteaded briefly near Red Deer, Alberta and worked on the first railway to Lesser Slave Lake in the winter of 1913-14. In 1914 he married Elizabeth O'Higgins and after about a year at Wauchope, they moved to Hartney, Manitoba. They returned permanently to the village of Wauchope in September, 1923, where his wife predeceased him in 1947.

In his own words, Pittman "attempted to popularize the study of natural history." This was done through articles and photographs published in many journals in Britain and the United States, though unfortunately many of these had little circulation in Saskatchewan. For some years he contributed to A. G. Lawrence's column, "Chickadee Notes", in the Winnipeg Free Press. Largely because of geography and partly due to his temperament, he studied nature by himself. In late June, 1921, P. A. Taverner and Hoyes Lloyd camped overnight in his yard at Hartney, Manitoba. I corresponded with Mr. Pittman on a few occasions beginning in 1942, and Mary and I visited him in St. Mary's home, Weyburn, in April, 1971, when his memory for recent events was already failing.

Collections of his photographs were exhibited in Winnipeg (date?), St. Louis (March, 1942) and New York



H. H. Pittman





Photo by H. H. Pittman, Wauchope

Western Yellow-haired Porcupine

December, 1972





Photo by H. H. Pittman

### Female Black-billed Cuckoo with grasshopper

City (1947). In addition to many photographs used to illustrate his articles, at least 31 individual photographs were used by *Bird Lore* (now *Audubon Magazine*) between 1916 and 1932, with an occasional use of others as late as 1965. Two of his photographs of Sharp-tailed Grouse in winter and one of downy Killdeers, were used in Bent's *Life Histories*. These photographs were of a remarkable quality, considering that all were obtained with an old-fashioned single plate camera purchased about 1905. Up to 20 minutes of preparation and careful focussing were required before each exposure; usually his wife assisted him in this delicate operation.

I wish to thank his daughters, Mrs. Gertrude Van den Boer and Miss Pat Pittman, both of Manor, Sask., for the generous loan of their father's field notebooks. The exhibit collection of his photographs has been donated to the Saskatchewan Archives, Saskatoon and the remaining portion of his egg collection to the Biology Museum, Saskatoon campus, University of Saskatchewan.

The following incomplete list of his published articles, almost all illus-

trated with his own photographs, has been compiled by Mary Houston. It will serve to demonstrate the wide range of his interests.

#### *Bird-Lore*

- Jan.-Feb. 1916. 18:1-6. Some Canadian Grouse ( 8 ill.)
- Nov.-Dec. 1917. 19:332-33. The American Crossbill (1 ill.)
- Jan.-Feb. 1918. 20:55. Snowy Owl (1 ill.)
- Mar.-Apr. 1925. 27:92-96. The Food of the Western Horned Owl (3 ill.)
- July-Aug. 1926. 28:262-64. Some Notes on Sitting Birds (1 ill.)
- Jan.-Feb. 1928. 30:5-7. Mallards on the Prairie (1 ill.)
- May-June 1928. 30:181-82. Canada's New Bird (1 ill.)
- Sept.-Oct. 1929. 31:327-29. A Rail with a Rail ((2 ill.)
- Nov.-Dec. 1929. 31:393-95. Herding the Birds (1 ill.)
- Sept.-Oct. 1931. 33:318-20. Field Notes on Marbled Godwits I (3 ill.)

#### *Audubon Magazine*

- July-Aug. 1960. 62:168-69. A God Samaritan (2 ill.)



*Nature Magazine*

- Oct. 1937. 30:205-06. Protective Resemblance in Nature (3 ill.)  
July 1942. 35:299-301. The Black-billed Cuckoo (4 ill.)  
Feb. 1943. 36:91-92, 105. Ogres of the Prairie (2 ill.)  
Oct. 1943. 36:405-06. Clay-colored Sparrow (3 ill.)  
July 1944. 37:299-301. The Long-tailed Weasel (4 ill.)  
Apr. 1947. 40:190-91. Goldfinches in Saskatchewan (2 ill.)  
Sept. 1948. 41:373-74. Architects with Leaves (3 ill.)  
Mar. 1949. 42:125-26. The Brown Shrew (2 ill.)  
July 1949. 42:266, 292. Grasshopper Mice (1 ill.)  
July 1951. 44:299-300. The Female Phalarope Is Boss (2 ill.)  
Sept. 1952. 45:378-79, 386. Garter Snakes in Saskatchewan (2 ill.)  
Feb. 1953. 46:75-76, 108. The Kestrel (2 ill.)  
Apr. 1954. 47:209-10, 218. Painted Turtles in Saskatchewan (3 ill.)

- Mar. 1955. 48:135-36. Sprague's Pipit and Others (4 ill.)  
July 1955. 48:317. An Albino Holboell's Grebe (1 ill.)  
May 1956. 49:237-39. Sandhill Cranes in Retrospect (6 ill.)  
Jan. 1958. 51:24. Prairie Gulls (1 ill.)  
May 1959. 52:257. Butterflies in the Rain (1 ill.)

*Condor*

1927. 29:140-43. The Black Terns of Saskatchewan (4 ill.)

*Canadian Field-Nat.*

1926. 40:60-62. The Prairie Pocket Gopher (2 ill.)

*Can. Geographical Journal*

1932. 4:131-34. Prairie Hares in Winter (4 ill.)  
1933. 7:127-132. The Prairie Orchestra (9 ill.)  
1955. 51:198-205. Gophers of the Prairie (8 ill.)

*Journal of Mammalogy*

1924. 5:231-33. Notes on Feeding Habits of the Little Brown Bat (2 ill.)



Photo by H. H. Pittman

Greater Prairie Chicken on nest





Photo by H. H. Pittman

## Young Red Crossbills

### *Blue Jay*

1944. 2:27-28. Swainson's Hawk (no ill.)

1957. 15:58-59. Saving the Cranes (1 ill.)

1959. 17:30. Short-tailed Shrew at Wauchope ((no ill.)

### *American Field*

Sept. 16, 1911. Wading for Ducks in Manitoba

### *Rod and Gun*

Aug. 1927. Among the Branches

### *Science Gossip*

Jan. and Feb. 1910. Some Canadian Animals.

### *Outdoor Canada*

May 1945. Swainson's Hawk

July 1945. Our Largest Moths

Oct. 1945. Skunks

Oct. 1945. Gophers

Oct. 1945. Bats in Saskatchewan

Nov. 1945. Home Wrecking Wren

Jan. 1946. Round Stones

Jan. 1946. Nuthatches

Mar. 1946. Animal without a friend;  
My friend the Toad

May 1946. Stone Arrowheads

July 1946. Nighthawks on the Prairies

Aug. 1946. Dance of the Prairie Chickens

May 1947. Plovers

Aug. 1947. Antennae of Butterflies and Moths

Dec. 1947. Some Notes on Seed Dispersal

Jan. 1949. Prairie Turtles

Apr. 1949. Saskatchewan Killdeer

Sept. 1949. Prairie Fossils

### *Wild Life*

1914. On Some Canadian Rodents

*Illustrated London News*

Feb. 18, 1911. Sportsmen's Paradise  
Canada for the Hunter and Fisherman.

In addition, Pittman sold illustrated articles to the following popular newspapers and magazines:

*Country-side Monthly*: Four articles on mammals, 1910-1914.

*Country Life*: 20 articles including on birds and 11 on mammals, 1913-1925.

*The Nor'-West Farmer*: 2 articles on mammals, 1915.

*The Country Guide*: 6 articles, including 2 on birds, 1930-1955.

*The Western Home Monthly*: 1 articles, wide variety of subjects 1917-1922.

In addition, there were one to three articles in Grain Growers Guide, Family Herald, Free Press, Prairie Farmer, Regina Leader-Post, Winnipeg Free Press, Western Producer, Toronto Star Weekly and the Montreal Standard.



# GOOD RUTS, BAD RUTS

by Peter G. Kevan\*

In the March 1972 issue of *Blue Jay*, Dr. W. O. Kupsch writes of the confusion he finds in the description by Dalton Muir in the December 1971 issue of *Blue Jay* of ruts on the tundra. Dr. Kupsch points out that the ruts made by settlers' wagons crossing the prairie are historic sites, while those across the tundra are described by Mr. Muir as "scars on a fragile environment." Dr. Kupsch finds further confusion in assessing caribou trails, which he describes as "a natural destruction of the environment" and "'Acts of God' ". I would like to attempt to clarify the apparent dilemma and demonstrate that the three types of ruts considered by Dr. Kupsch are not really comparable in the terms of his presentation.

First, a comparison of the man-made ruts is worthwhile. It should be noted that the ruts across Saskatchewan could be erased from the landscape by deep ploughing, as have been the ruts of sections of many of the historical trails in Canada and the U.S.A.

Ploughing up ruts on the tundra, on the other hand, would only aggravate the situation, probably causing considerable subsidence as the result of the evaporation of water from the normally frozen ground-ice and permafrost (see MacKay 1970). Also, revegetation is generally far slower in the arctic, and in some extreme examples has hardly commenced after more than 20 years (Hok, 1971). The slowness of revegetation increases the potential danger from erosion, slumping, etc., as the ground remains unbound by roots and subject to the action of weather and frost for much longer periods of time. Hence, rut creation on the tundra presents more of a serious potential problem than on the prairies. It is that fact, among others,

\*Note: Dr. Kevan has worked widely as an Arctic Biologist. He is now at the Plant Research Institute, Department of Agriculture, Ottawa.

that requires the tundra to be regarded as more delicate or fragile than other biomes. Aspects of conservation and the effects of industrial man's activity on tundra are discussed more fully in Fuller and Kevan (1970), Kevan (1971a), Legget and MacFarlane (1972), and others.

It is not that many of the effects of tracks and ruts are peculiar to the tundra. After all, gullying, slumping, sheet erosion, etc., are not uncommon in the south, where they are often the result of incorrect land use practices and carelessness. As it has been proved that tundra is more susceptible to man-made damage or disturbance, however, extra care and knowledge are necessary for operating on it.

While I agree that Parry's ruts across Melville Island made in 1820 are of historical interest, and compare, therefore, with Saskatchewan's Boundary Commission Trail (the example used by Kupsch), I cannot agree that ruts of the commonness with which they criss-cross the Tuktoyaktuk Peninsula have now, or ever will have, much historical value. Part of historical value lies in rarity, the other part in significance. The significance of the tundra scars is known in relation to oil exploration, over-consumptive economy, and their being a stark, displeasing and lasting reminder of some colossal blunders and gross carelessness which could have been avoided. Given that they have that historical significance, they are hardly rare, or likely ever to be so since they appear to last indefinitely. Dr. Kupsch quotes Alcock's (1947) mention of "as many as twenty parallel ruts" from the historic Red River cart trails across the prairie; Mr. Muir's photograph of tundra (1971) shows at least 22, the result of oil exploration vehicles. Also, the trails described by Alcock resulted from "carts, in brigades, often one hundred strong,



[which] usually travelled in single file along trails that are followed year after year" (p. 35), whereas those photographed by Mr. Muir are each the result of a single passage. Dr. Kupsch neglects to mention these differences. Furthermore, the Red River carts probably exerted greater pressure on the ground than most tracked vehicles used on the tundra.

I suggest that the tundra and the prairie are very different in their relative capacity to absorb man-made disturbance. On the tundra the ruts cannot be erased, represent potential hazards or problems in some places, and, because of their commonness and apparent permanence, will have little or no historical value. On the other hand, the ruts in Saskatchewan can be eradicated, do not represent any form of a problem other than a slight bump to overland driving, and are sufficiently rare and of great enough significance to have considerable historical value.

Second, an examination of animal-made ruts and trails is in order. In terms of the aesthetics of landscapes and natural environments, it is not realistic to compare animal trails with artificially made ruts, even though it might be considered objective to do so. I cannot agree that the trails trampled by migrating caribou constitute "destruction of the environment" as Dr. Kupsch claims. Except in special places where some disruption may occur, such as on mountain passes, isthmuses, and other land forms which force the animals together, migrating caribou follow a myriad of interlacing trails. Their hooves individually pock the ground, flattening vegetation. The result is not a continuous line of evenly depressed vegetation, as results from vehicle movements; nor is the vegetation continuously cut into small rectangles which may be broken loose, as can result from a tracked vehicle's passing. Thus the trails of caribou are less likely to alter drainage patterns, particularly since caribou fan out in wet meadows, which may be susceptible to drainage; and tend to follow

easier rather than direct routes, particularly following contours of hills, so avoiding steep pitches, embankments, etc., which may be susceptible to erosion. Vehicles, on the other hand, tend to travel more or less direct routes up and down fall-lines to save time and to avoid tipping over. Also, caribou do not cut and kill vegetation in continuous strips. Kevan (1971b) has described the sorts of effects from tracked vehicles and points out that sedge-meadows can be, and are being, slowly drained as a result.

I hope that this essay has helped explain the confusion brought out by Dr. Kupsch, and has demonstrated that random, unrestricted, vehicle traffic should not be permitted on the tundra.

The arguments I have presented show that the value systems of historians and conservationists are not at loggerheads, but rather that they cannot be compared in relation to this "rutty" problem.

#### LITERATURE CITED

- Alcock, F. J. 1947. A century in the history of the Geological Survey of Canada. *Nat. Mus. Canada Special Contrib.* No. 47-1, vii + 94 pp.
- Fuller, W. A., and P. G. Kevan (Editors). 1970. *Proceedings of the Conference on Productivity and Conservation in Northern Circumpolar Lands*. Edmonton, Alberta, 15 to 17 October, 1969. International Union for the Conservation of Nature and Natural Resources, Morges, Switzerland. Publication in The New Series No. 16, 344 pp.
- Hok, J. 1971. A reconnaissance of tractor trails and related phenomena on the North Slope of Alaska. U.S. Dept. of Interior, Bureau of Land Management. 66 pp.
- Kevan, P. G. 1971a. Oil under the tundra in the Mackenzie Delta Region. *Can. Field-Nat.* 85:99-100 and 122.
- Kevan, P. G. 1971b. Vehicle tracks on high arctic tundra: an 11 year case history around Hazen Camp, Ellesmere Island, N.W.T. Defence Research Board, Ottawa; Operation Hazen No. 41. 17 pp.
- Kupsch, W. O. 1972. Reflections on ruts. *Blue Jay* 30:69-70.
- Legget, R. F., and I. C. MacFarlane, (Editors). 1972. *Proceedings: Canadian Northern Pipeline Conference*, 2-4 February 1972. National Research Council of Canada, Ottawa. Technical Memorandum 104. NRCC 12498. v + 331 pp.
- MacKay, J. R. 1970. Disturbance to the tundra and forest tundra environment of the Western Arctic. *Can. Geotech. J.* 7:420-432.
- Muir, D. 1971. The environmental crisis in the Arctic. *Blue Jay* 29:172-178.



# THE STE. SCHOLASTIQUE INTERNATIONAL AIRPORT

## A STUDY OF ENVIRONMENTAL IMPACT

by **R. Bider**, Macdonald College, P. Quebec

In the summer of 1966, the Air Services Branch of the Department of Transport in Ottawa initiated "an elaborate and careful" study of the possible development and evolution of Montreal Civil Aviation. Then on March 27, 1969 the Federal Government announced that Ste. Scholastique had been chosen as the site of a new international airport and expropriation plans were filed for 95,000 acres northwest of Montreal. Within months of the announcement soil test holes were being dug and firm commitments regarding the location of quarry sites, runways and access roads were being made. By the summer of 1970 the clearing of land for the runways, aprons and taxiways was completed, the main service road was under construction and railway engineers were in the process of choosing a new right-of-way through the airport which would conform to the expected industrial development of the area.

At this point Dr. W. Schneider, chairman of the National Research Council, and others, made plans for an ecological study of the airport area. Dr. Pierre Dansereau, then professor of ecology of the University of Montreal, was named director of the project with supporting scientists from five universities. Since the plan was to study the total ecology of the airport area, the researchers chosen to take part included a geomorphologist, plant and animal ecologists, a geographer, a chemical engineer with special interests in pollution problems and a social psychiatrist with an interest in human ecology. Unfortunately, funds for the project were strictly limited and the researchers were not able to study the resources of the area or the effects of the new airport in detail.

The geomorphologists provided a description of the physical units which

make up the area and descriptions of the events which sculptured the landscape since the glaciers retreated. The plant ecologists concentrated on the masses of vegetation, their structures and their dynamic nature. The land-use geographers drew up three basic maps, two based on air photos of 1927 and 1966, and the third a detailed ground-site survey carried out in 1971. These maps showed clearly the accelerated rate of change in land use in recent years. The animal ecologists determined the animal resources of the area, one group taking a community activity approach while a second looked specifically at the bird resources, particularly those which could be a hazard to aircraft. The human ecologists studied the view residents have of their environment and gained some appreciation of the state of the mental health of the community. The last group, whose principal preoccupation was a concern for possible pollution, also became responsible for the final integration of all the studies.

To date there have been in the NRC study eight reports ranging from about 50 to 300 pages, about 20 maps, and several other nearly completed pieces of work. In retrospect, we can see that the greatest challenge lies not in providing reports on the ecology of the airport, but rather in using the ecological data provided to design and administer the airport sensibly by providing and maintaining a quality environment while making the best possible use of the natural resources.

The following is a summary of the study.

### The Area

The location of the airport and runways appears to have been chosen after consideration of criteria, most of which dealt with air and land

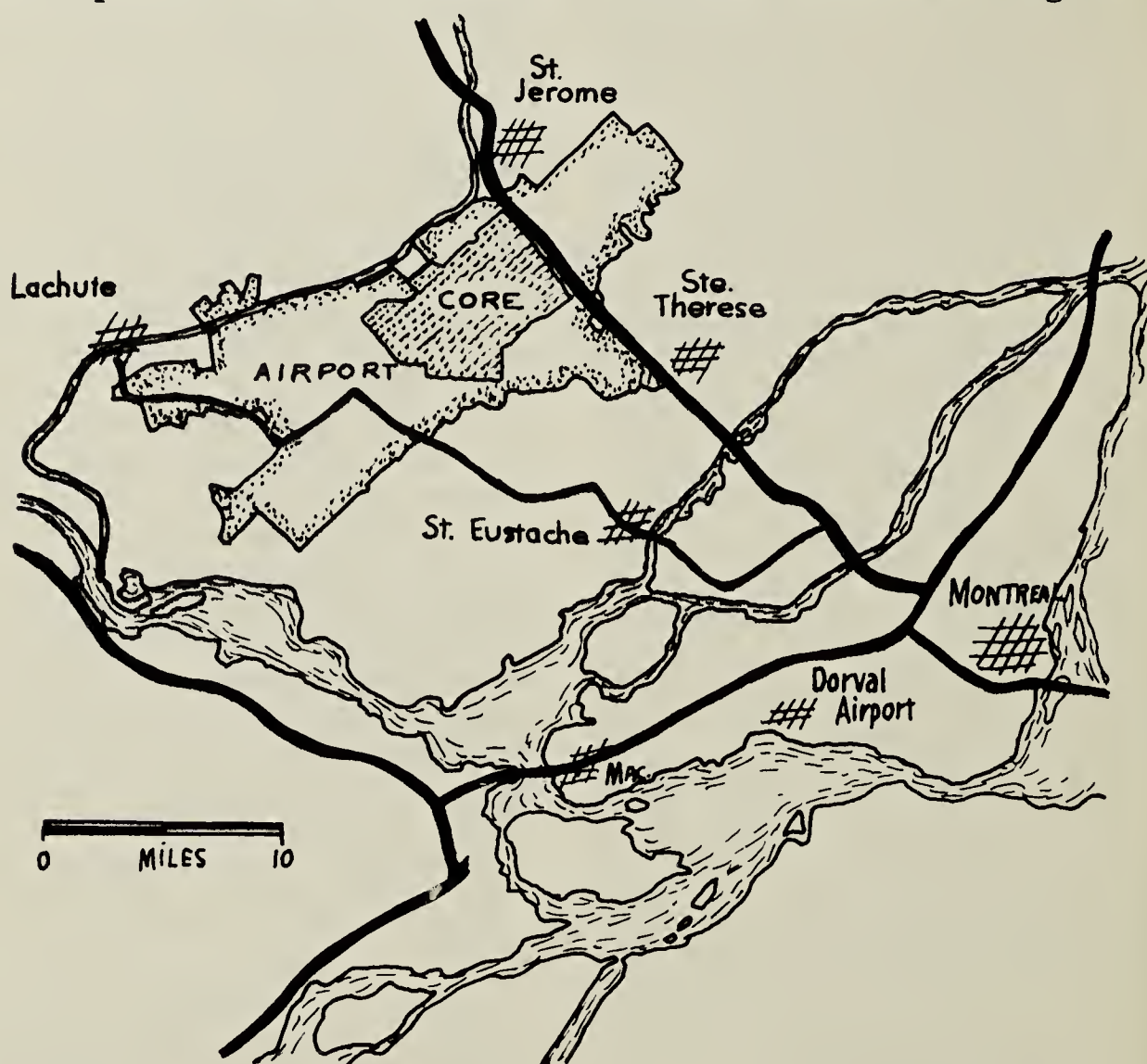


traffic routes now and in the future. The size of the area to be expropriated was determined by estimating the limits at which the fulltime operation of the airport would not cause complaints by neighboring residents. The precise boundaries were drawn along present lot lines as close to the theoretical complaint limit as possible. This resulted not only in the acquisition of an immense piece of land, but one which could be characterized by its ecological diversity, possibly even a capsule example of the St. Lawrence valley plain.

The general orientation of the airport is from southwest to northeast, along the northern edge of the St. Lawrence valley at the base of the Laurentian Mountains. Except in the most western region where the airport encompasses a small portion of the granitic Laurentians, the northern boundary consists of the North River, which is polluted from the untreated

discharges of several Laurentian villages, towns and industries. Along the course of the picturesque meandering river are a few oxbows and some spectacular sand dunes, nine million tons of which are destined to become the base of the airport runways. As we look to the south from the river across the sand we can see grey birch at the far edge of the dunes. Beyond these are stands of spruce, hemlock and pine interspersed with stands of aspen pioneering on abandoned fields and finally the predominantly maple forests which form the largest part of the skyline.

The crest of the hill is mostly composed of glacial till, but the plateau which extends to the south, is a mosaic of soils and ecological communities. Almost at the centre of this plateau is a large bog about two square miles in extent. Around the bog are mo



Map showing size and location of the new international airport in relation to the present Dorval Airport on the Island of Montreal.





An aerial view showing the land use pattern of the Ste. Scholastique airport area. Treed areas are on glacial till.

aines, like islands of rubble, protruding from the large expanses of heavy clay deposited not so long ago by the Champlain Sea. Scattered about are small patches of muckland, rich in organic matter and often above a layer of pearl white marl sometimes reaching nearly five feet in thickness. In several areas but particularly to the southeast are large beaches of sand of varying thicknesses deposited over the clay base. Because of their low fertility many of the sand and till areas were not cultivated and the forests which have remained have been a source of saw timber, firewood and maple products since colonization. For the most part the rich clay, loam and muck soils are cultivated. Hay, corn and pasture grasses are grown for dairy cattle, the basis of the agricultural industry of the region. Scattered among the dairy farms are the occasional fields of oats and wheat, sod grass farms and in some areas where irrigation has been installed there are small fruit and truck farms.

At the southern limit of the plateau, there are deep eroded gulleys which lead to the floor of what once was the Ottawa-St. Lawrence riverbed, some twenty feet below. The rim of the plateau, or the shore of the old river, is definable over a distance of about 20 miles between St. Hermas to the west and Ste. Thérèse at the extreme southeast corner of the airport. The soils in the old riverbed are largely derived from marine clay and except where there is poor drainage, the land is used for farming much in the same way as it is on the higher plateau. Although there are some maple woods and a few cedar thickets on the lower plain, the trees which are most impressive are the tall elm and ash which grow along fence lines and the round clumps of willow which line some of the streams. It is in this area during the summer that one feels the impact of tragedy of the Dutch elm disease which is now killing the trees which for so many years provided shade to clusters of passive Holstein cattle.



Some people claim that much of the character of the landscape and people can be seen in the fences used. There are no dainty little white picket fences or strong thorny hedges in the region and there are few steel post and barbed-wire fences. The fences of the region, rather, conform to the resources of the land. On the main plateau where there are large amounts of stone, either ice rafted or deposited as glacial till, the older fences are commonly made of stone or sometimes a combination of stone and wood. In the more wooded areas many rail cedar fences still exist attesting to the fact the cedar has been continuously exploited and that no cedar large enough to split has been found for some time. Where the farms are on the large flat expanses of clay, and cedar is not available, farmers have compromised with the times and have strung wire on cedar posts.

Farms in this part of Quebec are for the most part long and narrow and the houses are usually built a few feet from the roads which tend to run through the centre of the best agricultural land. The odd ornamental maple or butternut tree might be grown near the house, but in general the farm buildings stand stark and unprotected from the elements. Toward the ends of the narrow strips of land are the woodlots of varying size and quality, most of which used to be far more exploited for wood and sugar products than they are now.

The people of the land are warm, friendly, resourceful, but have no time for transients and intruders who simply possess houses without working the land. They communicate extremely little with the cool urbanites. Land and houses are recognized by the names of the traditional occupants rather than by their numbers. Social contacts seem to be more frequent with family than with neighbours, and when extra hands are needed, these are usually provided from among family members. Unlike the situation in the Gaspé, however, where one tends to see clusters of the same names on mail boxes, here families do not tend to concentrate. Surprisingly

enough, even though neighbours are independent of one another, it seems that once a critical mass of farmers leave a *rang* (road on which farm lots front) the emigration of the remaining farmers accelerates and they tend to move to areas where their neighbours had relocated.

### The Changing Environment

Once we started working on the area it soon became apparent to all researchers that it was far too late for baseline studies. This was not only true for the operational area but also for a large part of the 77,000 acres around the core. The expropriation of the land had virtually transformed the personalities of the residents and even the people who travelled through the area. Possibly the sense of imminent disaster or possibly the lack of trust in Government agencies led many to throw in the towel and move even when their houses or farms were not threatened. Before they left, many cut the saleable timber out of their woodlots and abandoned the land without consideration of the future. Within days or sometimes hours abandoned houses were pillaged and vandalized. Eventually fence posts and any good fencing disappeared. Soon the vandalized houses had to be burnt and their remains buried and the land was put to rest after more than a century of exploitation.

Farther away from the core area there was less abandonment; however, even in these areas there seemed to be a great deal of turnover in the occupants of houses and this will undoubtedly change the life style of the area. A large number of the new residents were not there to farm, and some of the more aggressive local farmers were quick to exploit the unoccupied land. Abandoned hay fields were usually only harvested, without the addition of the lime and nutrients necessary to maintain the land.

Only the land form is unaffected by the sociological changes occurring in the area. Changes in the age structure and composition of the vegetation are occurring quickly because of the illegal exploitation practices committed



during abandonment. Now you can find woodlots which have been reduced to merely a fringe of trees around a slash pile. New habitats are being created for the native animals. Some populations of animals, like the voles, coyotes, fox, marsh hawks, are faced with unlimited resources while others like the rats become temporary problems while they seek to reestablish themselves in the remaining buildings.

### Reflections on the Grand Design

The Ste. Scholastique airport with its large control area was a worthwhile concept. This arrangement opened all kinds of possibilities as far as land management was concerned. It could have been the first experiment in socialized land use in a non-socialistic state. It certainly should have been made into a model of proper land use in a country where up to now speculation, urbanism and industrialization, the keys to "sound economic growth", have always seemed to dominate the themes of master planning

and where historic events have carved lot boundaries which had made the rational use of natural resources almost impossible.

As things stand now the Ste. Scholastique Airport Grand Design will likely be just another large airport with spectacular long runways, large buildings and high control towers. This gargantuan masterpiece will be set in a wasteland of abandoned farms and poorly managed resources where the owners, like outdated irresponsible industrialists, will insist that it is not economically viable to protect the land and make proper use of it.

This predictable situation (which shows signs of becoming fact) will have come about because authorities who run airports have neither the inclination nor the desire to manage people other than those who are at work at the airport. Oddly enough, it was because they did not want to be bothered by neighbours that the authorities decided to buy all the land around the airport core.



A dead elm in an old farm pasture. This picture also depicts the landscape in the old river channel in the southern portion of the Ste. Scholastique airport zone.



With 20-20 hindsight solutions seem simple and the following thoughts might have been useful if such Grand Designs were still a gleam in the eye of politicians.

First and foremost, airport core administrations should be a separate entity from the buffer zone administration. In this way there would be much less likelihood of plundering the buffer zone for the sake of the core area. If the core area, for instance, saved 10 million dollars because it was able to get sand and stone from the buffer zone, then this saving should be a credit to the buffer zone account and not to that of the construction of the airport proper.

Second, a task force of a few wide-awake conservationists should fly over the area to determine the most obvious natural features which must be saved. If this had been done at Ste. Scholastique, the sand dunes would never have been massacred. In fact, conservationists would not have even let them go in to make the crater-like

irreparable probe holes to evaluate the quality and quantity of those particular sand resources. The conservation task force might also set priorities for studies which might very well show that some areas might contain unique flora or fauna or natural communities. The group might point out sources of pollution which should be controlled as part of the cost of land management. *Belle Riviere* (Pretty River), whose head waters are the bog of the core area, is an open sewer for the town of Ste. Scholastique, the wastes of a rendering plant and a cheese factory all located on the airport site. This river is so polluted that one can stand on an old dam at an abandoned grist mill, just below Ste. Scholastique, and watch the gases bubble up to the surface of the slimy green water. If you can stand the smell, the pond is really very pretty, framed by healthy overhanging bright green willows. Because of the potential indirect hazard to aircraft, the fact that most urbanists understand the



The beginning of the construction of the Ste. Scholastique 2½ mile runways which will be suitable for the jumbo jets and supersonic transports.



mplications of solid waste disposal and the low remedial costs of cleaning them up, most of the dumps have been closed and covered over. Strangely enough, the largest dump in the region located in the northeastern section was excluded in the expropriation and now forms the boundary of the airport at one point.

Third, planners should have on their staff a group of people who understand the land, its people and their institutions. This group could be made up of community resource developers, rural sociologists, extension specialists, land-use agronomists and ecologists. These people could initiate designs, but their most important role would be to evaluate the plans of the town planners, urbanists and engineers who in our present system have all the power to decide what will be done with the soil and living rural landscape. A group such as this completely enmeshed in the day-to-day operations of the management of the land at Ste. Scholastique could have foreseen and possibly suggested alternate methods or procedures which would not only have kept the people on the land, and the land in production, but in all probability could have brought the whole of the airport including the land and its people into a harmonious productive unit.

Fourth, the order of priorities should be changed. Before hiring the first soil test company or group of civil engineers, the buffer zone land administration body should begin applying their land management plans. At Ste. Scholastique, because the land planning program was late and indecisive, half-baked plans kept appearing in publicity releases and unfounded rumours spread making the authority ineffectual. The land administration body should also be responsible for the application of acts and laws such as those concerning pollution or the misuse or abuse of the land by their tenants. Administration should also set and enforce rigid rules on agricultural and forestry practices which have been accepted by the rural land-use planners.

Fifth, baseline ecological studies (in their broadest sense) should be done now in all areas susceptible to change through grand designs and particularly at the limits of urbanization. It is most frustrating to have to spend time on a study in the St. Lawrence basin trying to determine the most important elements of the animal communities, or the relative importance of major soil types such as clay, sand, till or muckland to the animal fauna when you should be studying potential impact of changes in land use. The Canadian Land Inventory took us one step nearer to this objective, but when we were confronted with a development such as that of Ste. Scholastique, we realized the need for a more detailed study of a greater number of species and also the need to integrate the present land use and social factors into one system.

### The Last Word

Perhaps the Government now feels it has bitten off more than it can chew. Possibly the rivalry between the Ontario and Quebec politicians concerning the size difference between the Pickering, Ont., and the Ste. Scholastique airports will inevitably make the powers decide to give back half of Ste. Scholastique to the natives. I, for one, would be sorry to see this happen, not that I think the experiment has been a success, but because the completion of Ste. Scholastique will give planners, administrators, resource scientists, and even politicians an experience and many lessons which should profit all Canadians.

### GIFT SUGGESTION

Give a 1973 membership in SNHS to someone this Christmas. The December 1972 *Blue Jay* will be free to anyone taking out a new membership at this time. Send \$3 to George Dodd, Box 1321, Regina.



# RECOVERIES OF SASKATCHEWAN COMMON TERNS

by C. Stuart Houston, 863 University Drive, Saskatoon

Although few in number, the recoveries of Common Terns banded in Saskatchewan are of considerable interest for the following reasons:

1. This is the only species which yielded a lower recovery rate from Saskatchewan banding in the 1930's, than from banding since 1950.

2. This species travels great distances. My first recovery was from the Cook Islands in the southern Pacific Ocean, nearly 3000 miles south of Hawaii and over 6000 miles from Saskatchewan (Houston, 1962), and another reached Costa Rica.

3. One recovery prior to 1950 and one recovery since, were from Minnesota, while all other recoveries outside of Saskatchewan were from the Pacific coast. Further west, the three reported recoveries from early Alberta banding were from the Pacific flyway, two from California and one from Peru (Austin, 1953).

4. The only recovery as an adult at a nesting colony was of a nine-year-old-tern, caught while nesting at Old Wives Lake, after having been hatched at Last Mountain Lake. Dr. R. W. Nero and Fred W. Lahrman had a long net placed between a dry-land colony of Western Grebes and the water (Nero, Lahrman and Bard, 1958). The banded tern from an adjacent tern colony became entangled in this net; it was released unharmed after its band number had been recorded.

5. Rapid speed of migration is evident from two terns, still unable to fly in mid-July at Redberry Lake. They were recovered at Malibu, California on October 14 and in Colima, Mexico on October 18 of the same year, after respective travels of 1810 and 2320 miles in less than three months.

6. Vermeer and Reynolds (1970) and Switzer, Lewin and Wolfe (1971), have demonstrated high DDE levels in

Common Tern eggs collected from Alberta and Saskatchewan colonies. Their migration routes in relation to areas of possible pesticide contamination thereby become important. Glen A. Fox (pers. comm.) and Switzer, Lewin and Wolfe (in press), suggest that the terns in western Canada may have accumulated high DDE levels on their Pacific wintering grounds. If so, "the generally higher DDE residue levels in the eggs of California Gulls than in those of Ring-billed Gulls," which Vermeer (1970) postulated might be due to a difference in diet, would more logically be explained by the different migration routes of the two species. As will be mapped in future issues of the *Blue Jay*, the California Gull migrates along the more polluted Pacific coast, as compared to the "cleaner" inland route of the Ring-billed Gull.

In addition to the localities mentioned in the list of recoveries below W. I. Lyon banded 47 Common Terns at Redberry Lake in 1937 and I have banded 24 Common Terns at Goose Spirit Lake, 27 at Quill Lake and 13 at Jackfish Lake, without any recoveries from these localities. The following are the 12 recoveries of Common Terns banded in Saskatchewan by three different banders: (Note: 514 1043 means 51° 40' North and 104° 30' West).

**Banded by George H. Lang, "Dr. Lake" (502-1034); (447 banded):**

Banded July 19/32. Fish net June/32 (4 yr.) One-mile L., Minn. (46-0955).

**Banded by Fred Bard at Last Mountain Lake 512-1051); (1244 banded):**

Banded June 24/40. Injured July 18/40 (7 yrs.), Strasbourg, Sask. (510-1045).

Banded July 8/48. Trapped June 21/50 (9 yrs.), Old Wives L., Sask. (500-1055).



Banded by C. Stuart Houston at Last Mountain Lake (512-1051); (254 banded):

Banded July 8/56. Found dead Nov. 26/60 (4 yrs.), Ureia, Aitutaki, Cook Islands (18° 50' South, 159° 40' West).

Banded by C. Stuart Houston at Red-berry Lake (524-1071); (1353 banded):  
Banded June 30/58. Fish net Jan. 15/59, Santiago Beach, Colima, Mexico (190-1042).

Banded July 23/61. Found dead July 18/64 (3 yrs.), St. Louis, Sask. (525-1054).

Banded July 25/65. Shot Feb. 15/66, Benito Juarez, Guerrero, Mexico 170-1002).

Banded July 9/66. Shot Oct. 18/66, (direct), e. of Tecoman, Colima, Mexico (185-1034).

Banded July 9/66. Found dead Sept. 26/68 (2 yrs.) nr. Hackensack, Minn. (465-0943).

Banded July 16/67. Fish net Oct. 14/

67 (direct) nr. Malibu, Cal. (340-1183).

Banded July 16/67. Caught by hand Jan. 19/70 (2 yrs.), Jaco, Costa Rica (093-0843).

Banded by C. Stuart Houston at Dore Lake (544-1070); (23 banded):

Banded July 19/69. Fish net Dec. 28/69 (direct), Manzanillo, Colima, Mexico (190-1041).

#### LITERATURE CITED

- Austin, O. L., Sr. 1953. The migration of the Common Tern in the western hemisphere. *Bird Banding*, 24:39-55.
- Houston, C. S. 1962. Common Tern recovery from Cook Islands. *Blue Jay*, 20:58-59.
- Nero, R. W., F. W. Lahrman and F. G. Bard. 1958. Dry-land nesting site of a Western Grebe colony. *Auk*, 75:347-349, pl. 15-17.
- Switzer, B., V. Lewin and F. H. Wolfe. 1971. Shell thickness, DDE levels in eggs, and reproductive success in common terns in Alberta, Can. *J. Zool.*, 49:69-73.
- Switzer, B., V. Lewin and F. H. Wolfe. Effect of DDE on reproductive success in Common Terns at Chip Lake, Alberta. *Can. J. Zool.*, in press.
- Vermeer, K., and L. M. Reynolds. 1970. Organochlorine residues in aquatic birds in the Canadian Prairie Provinces. *Can. Field-Nat.*, 84:117-130.

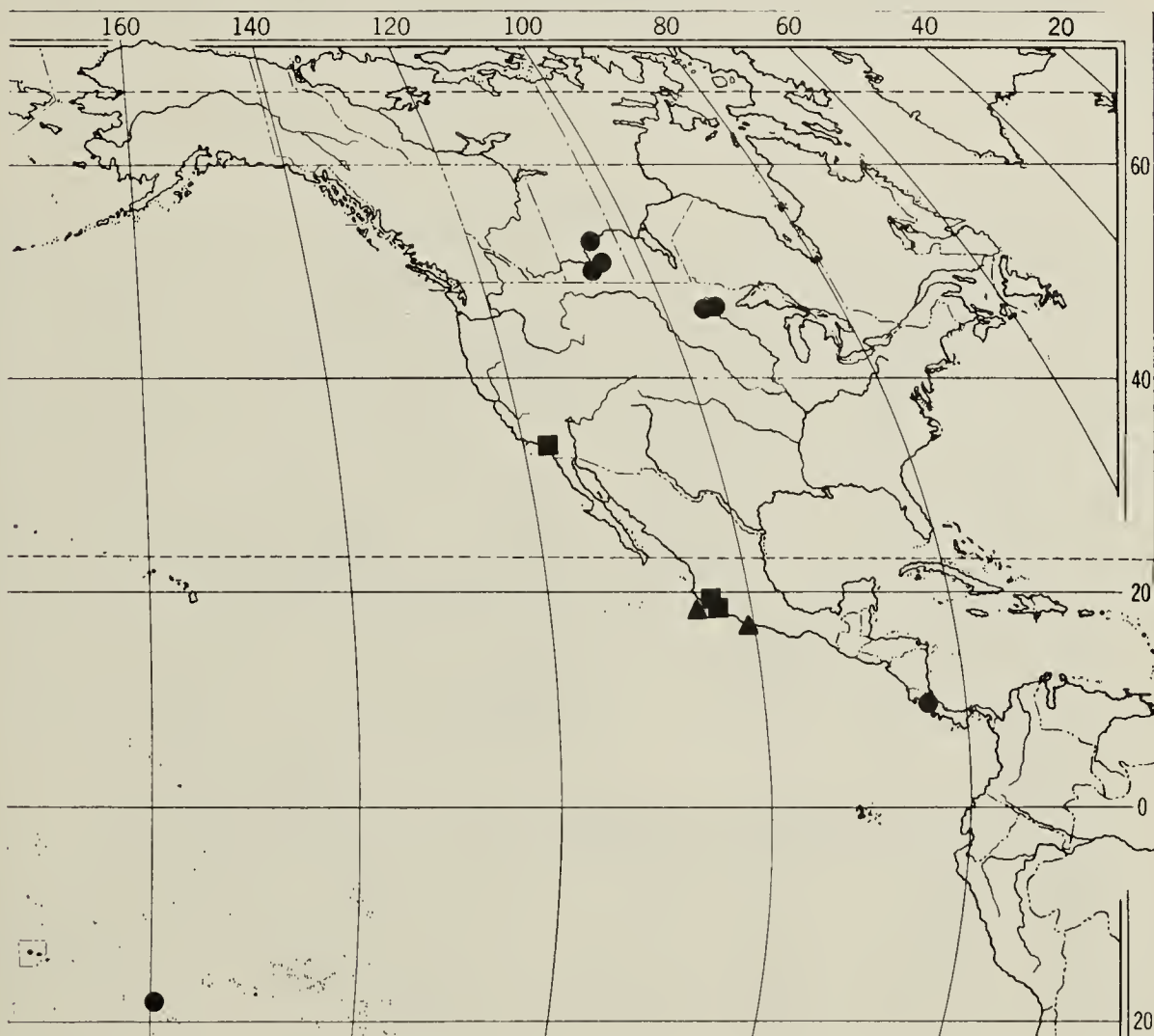


Fig. 1. Recoveries of Common Terns banded in Saskatchewan, 1932-1971. Note: squares represent direct recoveries (same year); triangles, January 1 to June 30 of following year; circles, more than one year old.



# COMPARISON OF THE CLUTCH INITIATION OF CASPIAN AND COMMON TERNS AT LAKE WINNIPEG

by **Kees Vermeer**, Canadian Wildlife Service, Edmonton

Incidental to an investigation of mercury contamination of eggs of Caspian Terns (*Hydropogne caspia*) and Common Terns (*Sterna hirundo*) during the summer of 1971 on Little George Island, 52°52'N, 97°47'W, in Lake Winnipeg, Manitoba, data were collected on clutch initiation of the two tern species.

From June 4 to August 7, 1971 daily observations were made on Common and Caspian Terns on Little George Island, which is located 16 miles from the nearest mainland. For comparison, the clutch initiation of Common Terns was also investigated

during the last week of May and the first four days of June, 1971 at Kawinaw Lake, which is at the same latitude and 70 miles west of Little George Island. Fig. 1 shows the location of Little George Island in northern Lake Winnipeg as well as the location of Kawinaw Lake. Little George Island consists of 117 acres, is covered with trees and contains a pond. Approximately 1,000 nests of Caspian Terns and 700 nests of Common Terns were found on the island. About 150 pairs of Herring Gulls (*Larus argentatus*) were also nesting there. The Caspian Terns nested on a sandy area without

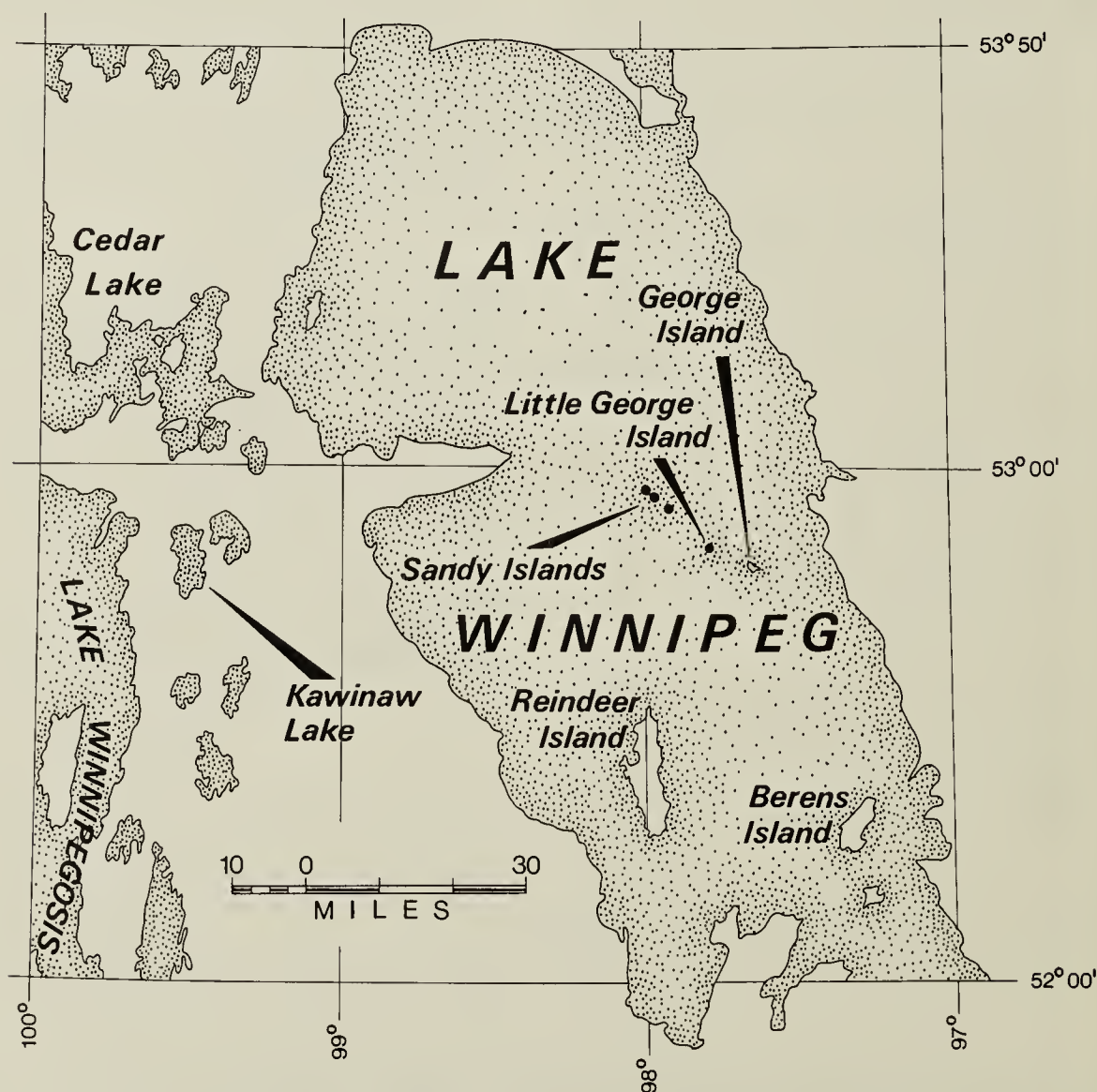


Fig. 1. Location of Little George Island in northern Lake Winnipeg and Kawinaw Lake.



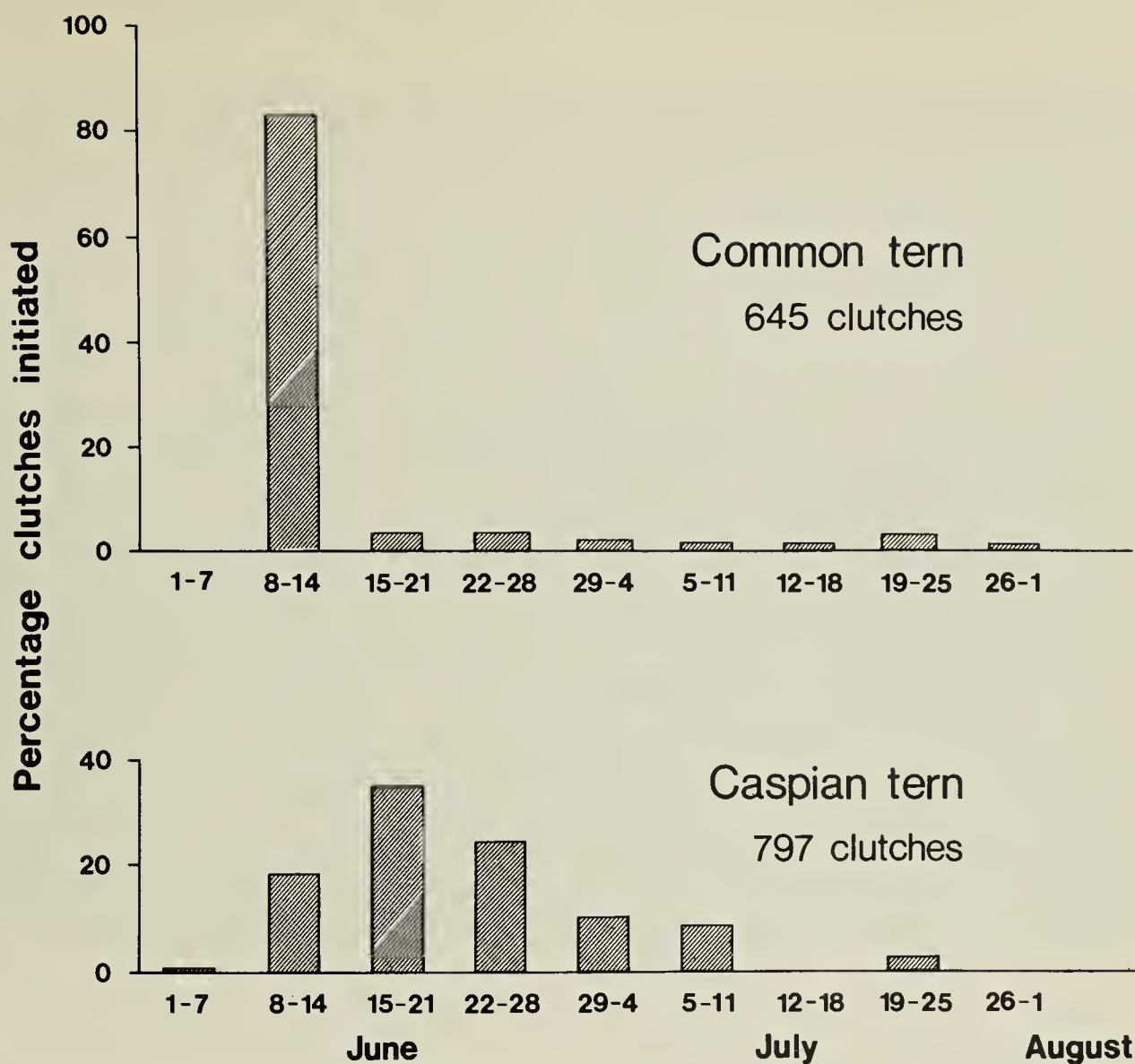


Fig. 2. Comparison of clutch initiation of Caspian and Common Terns at Little George Island in 1971.

vegetation near the beach. Common Terns nested more inland than the Caspian Terns on a sandy area with and without vegetation. The vegetation among which the Common Terns nested consisted of grass and raspberry bushes.

The clutch initiation of the two tern species on Little George Island is compared in Fig. 2. It can be seen that at least 80 per cent of the Common Tern clutches were initiated in one week, the second week of June. Eighty per cent of the Caspian Tern clutches

were started during a 3 to 4 week period, the last 3 weeks of June and the first week of July. Fig. 2 also shows that the clutch initiation for Common Terns was more abrupt at the start of the laying season than that for the Caspian Terns. The average clutch initiation for the Caspian Terns was significantly later than that for the Common Terns. The mean date of clutch commencement for Common Terns fell on June 15, that for Caspian Terns on June 22. Fig. 2 shows a small second peak of laying in the

Table 1. Clutch initiation of Common Terns at Kawinaw Lake during the last week of May and the first four days of June, 1971.

Date of clutch initiation	May 29	May 30	May 31	June 1	June 2	June 3	June 4
Number of clutches initiated	3	4	9	12	15	17	17





Fig. 3. Nesting habitat of Caspian Terns, Common Terns and Herring Gulls on Little George Island; massive object on beach is shipwrecked boiler. Two pairs of Herring Gulls nested in the boiler.

week of July 19-25, which is more pronounced for Caspians than Common Terns. This second peak probably represents mostly repeat laying, an average of 12 days after a gale occurred on July 8. One hundred and seven clutches were destroyed by that gale.

The clutch initiation of Common Terns at Kawinaw Lake in the beginning of the breeding season is shown in Table 1. From comparing Fig. 2 and Table 1 it can be seen that Common Terns at Kawinaw Lake started laying 10 days before those nesting on Little George Island. The 10 day delay in laying of Common Terns at Little George Island as compared to those at Kawinaw Lake does not appear to be related to differences in physiological changes brought about by a variation in day length as these two locations are at the same latitude. Ice disappeared from Kawinaw Lake and Lake Winnipeg in the first and last week of May respectively. The late disappearance of ice *per se* at Lake Winnipeg

is not thought to be the cause for the late clutch initiation of terns there as the ice disappeared from that lake one and one-half weeks before the terns initiated laying. However, the long-lasting presence of ice may have retarded the appearance of small fish and the emergence of insects on which Common Terns at Little George Island were observed to feed (Vermeer, in press). A shortage of food at the start of egg-laying may inhibit clutch initiation. Murton *et al.* ("The food and growth of nestling woodpigeons in relation to the breeding season." *Proc. Zool. Soc. Lond.* 141:747-781, 1963) found that the main proximate factor inducing laying in Woodpigeons (*Columba palumbus*) was the availability of food.

#### ACKNOWLEDGMENTS

The assistance of Messrs. J. A. Windsor and D. R. M. Hatch with the collecting of data on Little George Island is much appreciated.



# ANOTHER SUMMER CONCENTRATION OF COMMON LOONS

by **Ronald G. Predy**, Conservation Officer, Snow Lake, Manitoba

As an addition to the records of summer flocking of Common Loons reported in the June 1972 *Blue Jay* (30:85-86) by R. W. Nero, we wish to note the following.

About noon on July 25, 1972, Fire Ranger Russel Bartlett and I were out on patrol on Reed Lake in Grass River Provincial Park, Manitoba. In about the center of the lake, within a square mile area, we encountered a remarkable concentration of about 200 loons. Then, travelling on a bit, we realized that we were surrounded by loons; we estimated 500 birds altogether on the lake. I had never seen a concentration of loons like this before, though on previous patrols in this particular area of Reed Lake I recall always seeing at least a few.

The loons were gathered in pairs, but with only a few appearing to be in the close vicinity of others. No young birds were observed in the immediate area, but some loons were far away and young birds could have been missed. The birds were spaced fairly evenly throughout the area and there were no compact groupings. The birds were diving occasionally, but mostly they were just swimming around or simply resting. The day was sunny and the lake was calm with a light northeast wind.

As previously pointed out by Nero, most large concentrations of Common Loons in this region have been reported for an area within 50 miles of Flin Flon. It is thus of interest to note that Reed Lake lies just 50 miles east of Flin Flon.

## THE PASSENGER PIGEON — ADDENDUM AND ERRATUM

by **C. Stuart Houston**, 863 University Drive, Saskatoon

The article on "The Passenger Pigeon in Saskatchewan" (*Blue Jay* 30:77-83, June 1972) was material gathered to assist Dr. Arlie W. Schorger, Emeritus Professor of Wildlife Ecology at the University of Wisconsin. When he wrote me on November 23, 1971, for assistance concerning a point of history and geography, he was preparing a second, revised edition of his book, *The Passenger Pigeon*, which first appeared in 1955.

This book was an example of historical ornithology at its best. The bibliography listed well over 2,000 references, including many items Schorger gleaned from newspapers of the 1850's and 1860's. Not surprisingly, however, he was confused by the different "Pine Islands" on the Saskatchewan, and confused Cross Lake (there were actually three lakes by

this name between York Factory and Cumberland House) and Ile-a-la-Crosse; these accounted for two errors on page 261 of his book. Again, he can be forgiven for assuming that the younger Alexander Henry's Terre Blanche post (in present-day Alberta) was on Henry's Terre Blanche River (in modern Manitoba).

Since Doctor Schorger died on May 26, 1972, before he could complete his revision, it is perhaps best to record the following errors concerning his Manitoba migration records on page 284 of his book: Park River post was not in Manitoba, but in present-day North Dakota, about 43 miles south of the 49th parallel; Pine Island of Henry's observation was not a named locality; the Swan River observation of Daniel Harmon was not a migration date; the A. Henry observation



of August 31, 1810 at Terre Blanche, was in present Alberta.

Gary W. Seib and Gary Anweiler have both called my attention to a serious error in the caption depicting the University of Saskatchewan, Saskatoon campus, Biology museum specimen on page 80 of the June *Blue Jay* article. This was stated to be "the only specimen in Saskatchewan," but Seib and Anweiler called to my attention the presence of Passenger Pigeon specimens in the Swift Current Museum and the Saskatchewan Museum of Natural History, Regina.

Mrs. Clarence Wilson, curator of

the Swift Current Museum, writes that their specimen, dating from about 1886, was donated in more recent years by Charles Warren. It had been given to his father, George Warren of Swift Current, by Police Chief Jarvis of Bowmanville, Ontario, about 1910.

M. K. Baker, Director of the Saskatchewan Museum of Natural History, wrote to explain the absence of their two Passenger Pigeon specimens from the annual museum accession lists. In fact, these two specimens have not been accessioned and hence no information concerning them is available, except that they are believed to be from Ontario.

## NOTES ON A CAPTIVE POOR-WILL IN ALBERTA

by **Loran L. Goulden**, Biochemistry, University of Alberta, Edmonton

The purpose of this article is not to encourage the taking in or capturing of birds that could survive when left alone, but to report on an interesting house guest. On October 27, 1971, Mr. and Mrs. John Hostvedt, who farm near Lindberg, about 165 miles northeast of Edmonton, found by the doorstep of their house, a Poor-will (*Phalaenoptilus nuttallii*) that appeared to be sluggish. After taking the bird inside and finding that it became active, they released it. Three days later, however, it was back on their doorstep and since it was now cold outdoors and snowing, the Hostvedts decided to let it stay in their home (Lister, 1972).

The only authenticated record of the Poor-will in Alberta is of one collected in the Cypress Hills area of southeastern Alberta in 1945 (Salt and Wilk, 1966) a region about 350 miles south of the Hostvedt farm. The bird normally winters from central California, southern Arizona, and Texas south to central Mexico (Reilly, 1968). According to Godfrey (1966), it breeds from southern interior British Columbia, southern Alberta, northwestern South Dakota, and southwestern Iowa south (on the Pacific Coast from central California to southern Baja Cali-

fornia) and through eastern Kansas and central Texas to central Mexico. He adds that it probably breeds in southwestern Saskatchewan (Calf Creek). The basis for this last statement was provided by a collected specimen (Bard, 1961). A second collection was made in the same area in 1964 (Beck, 1965). Elliott states (1966) that the known range of the Poor-will in Saskatchewan includes areas ranging in climate from very hot and dry, such as the Great Sand Hills and the Frenchman Valley, to relatively cool and humid, like the Cypress Hills.

That the Poor-will "hibernates" during the winter in the northern part of its range has been known for some time. In 1946 Jaeger ('48, '49, '53) found a Poor-will in a torpid state in the Chuckawalla Mountains near the southeast tip of California, midway in the Colorado Desert between Salton Sea and the Colorado River. He observed it for three years as it came back to the same spot each year. One winter it slept without food for 88 days. The temperature of its body was as low as 64.4°F (18°C), never above 67°F (19.4°C). The normal temperature of an active Poor-will is known to be about 106°F (41°C).

Culbertson (1952) mentions finding





Photo by Loran L. Goulden

Poor-will showing beak and rictal bristles, June 24, 1972

a Poor-will in a torpid state in February when the temperature range was 22-56°F and Thorburg (1953) mentions finding another "hibernating" Poor-will in the Silverbell Mountains northwest of Tucson, Arizona, where the temperature was 73°F (23°C) on January 5, the day it was found. Brauner (1952) began a series of experiments to test the reactions of Poor-wills to light and temperature in an attempt to discover why the Poor-will "hibernates." His captive bird did not become torpid as a result of low temperature 36.5°F (3°C), shortened days with or without reduced temperatures, nor as a result of reduction in diet. He found that it moved about at the end of twilight and again just before dawn but remained stationary the rest of the time. The bird in its wild state has been observed to react in the same way as it goes about gathering insects during the twilight and dawn hours. Marshall (1955), in his study of hibernation in captive goatsuckers, found that dormancy was not caused

directly by low environmental temperature but by a lack of food. The birds did not become torpid until they were denied food and had lost 20 per cent of their weight. The captive Poor-will in Bartholomew *et al.* (1957) was fed *Tenebrio* (meal worm) larvae, beef heart, and lettuce and placed in a regulated air temperature; when the temperature dipped below 38°F (3.5°C), it became torpid and aroused when the temperature was raised to 72°F (22°C).

The Poor-will's normal food is made up of moths, beetles, chinch bugs and locusts—that is, mostly smaller, night-flying insects but also some picked up on the ground (Bent, 1940). The Hostvedts began feeding their Poor-will bits of hamburger but, after consulting Dr. D. A. Boag of the Zoology Department of the University of Alberta, added some barley chop to this, to substitute for the roughage normally obtained from the wings and hard coverings of the insects. It lived quite contentedly on this diet until late



June when it appeared sick, but visibly improved when it was fed insects that were gathered around the farm. Its plumage, however, became quite greasy and matted probably as a result of excess fat in the hamburger diet. Dr. Boag suggests that since the bird was kept in the kitchen near the stove where foods were being fried, it could have picked up the greasy condition from its environment. The condition of the plumage improved also with the addition of insects to its diet.

During the first few days of its captivity, the Hostvedts' Poor-will hissed, fluffed up its feathers, raised its wings, and opened its mouth wide when it was approached. Throughout this period it was fed by forcing open its mouth and cramming food into its throat. After these first few days the bird calmed down and began feeding itself. The Hostvedts placed the food on the side of an index finger and brought it near the bird which, after determining the food's position, then grabbed it with its mouth and swallowed it. During

March the Hostvedts' daughter Pat, who does not normally live at home, stayed at home alone with the bird; when she tried to feed it, the bird reverted to its old ways of hissing and showed its defence posture but after some time calmed down and accepted food. On one occasion when it attempted to seize the food, missed it and grabbed the end of Pat's finger, it apparently became confused and flew away to its normal resting place beneath the stove. Another amazing thing occurred at this point when the Hostvedts returned home. The bird perked up, began "chucking", and became excited in a way similar to that of a dog when its master greets him.

It was noted that the bird lost a few feathers throughout the winter and regrew them, but a much heavier loss occurred throughout February with no apparent change in the bird's activity. Just after he found the bird, Mr. Hostvedt noticed a scab-like formation on the upper mandible of the bird, which he removed without diffi-



Photo by Loran L. Goulden

Doorstep of the Hostvedt home with arrow showing where the Poor-will was found.



culty. However, the bill grew in an abnormal manner and became twisted similar to that of a Crossbill (*Loxia* sp.). This anomaly disappeared when a more normal upper mandible grew in during the latter part of June.

The Poor-will bathed regularly in a pan of sand placed for this purpose. Though water had been offered, the bird never accepted a drink, apparently obtaining sufficient moisture from its food. The bird was placed in a box at night so that it would not injure itself and was exercised (prompted to fly) each morning and evening.

It began to give its normal call at night about the end of January. Jaeger (1953) observed that Poor-wills start calling in late February or mid-March in California. If a person's hand approached the Poor-will from above, the bird appeared quite frightened but it reacted less violently to a hand below its eye level. If picked up and held it would try to escape, but if it was placed on the other hand, it would remain there with no attempt to escape. Furthermore, when the bird sat in the sunlight of the kitchen window, it allowed people in the kitchen to approach it without alarm, but if someone came near the window from the outside the bird would raise its wings, hiss and rock from side to side.

The Hostvedts released the Poor-will on July 12, 1972 near the Coldstream ranch just a few miles south-east of Vernon, B.C. This locality was selected because Poor-wills are commonly seen and heard in the area. It was raining on the day it was released but when last seen the bird was sitting apparently quite content and alert on a dry branch.

We can only hope that it readapted to its normal environment and that it flew south with others of its kind in the fall.

#### Acknowledgments

I wish to thank Mr. and Mrs. John Hostvedt of Lindberg and Pat Hostvedt of Edmonton for allowing me to use their observations and write about them. Thanks are due also to Dr. D. A. Boag for his suggestions.

#### LITERATURE CITED

- American Ornithologists' Union 1957. Checklist of North American birds. Fifth ed. 691 pp.
- Bard, F. G. 1961. First Poor-will specimen for Saskatchewan taken. *Blue Jay*, 19:172.
- Bartholomew, G. A., T. R. Howell, and T. J. Cade. 1957. Torpidity in the White-throated Swift, Anna Hummingbird, and the Poor-will. *Condor*, 59:145-155.
- Beck, W. H. 1965. Second Poor-will specimen for Saskatchewan. *Blue Jay*, 23:82.
- Bent, A. C. 1940. (Dover ed. 1964), Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies, part 1. U.S. Nat. Mus. Bull. No. 176. 244 pp.
- Brauner, J. 1952. Reactions of Poor-wills to light and temperature. *Condor*, 54:152-159.
- Brauner, J. 1953. Observations on the behavior of a captive Poor-will. *Condor*, 55:68-74.
- Culbertson, A. E. 1946. Occurrences of Poor-wills in the Sierran Foothills in winter. *Condor*, 48:158-159.
- Elliott, C. 1966. An extension of the known range of the Poor-will in Saskatchewan. *Blue Jay*, 24:7-8.
- Godfrey, W. E. 1966. The birds of Canada. Nat. Mus. Can. Bull. No. 203, Biol. Ser. No. 73 Ottawa, 428 pp.
- Jaeger, E. C. 1948. Does the Poor-will "hibernate"? *Condor*, 50:45-46.
- Jaeger, E. C. 1949. Further observations on the hibernation of the Poor-will. *Condor*, 51:105-109.
- Jaeger, E. C. 1953. Poor-will sleeps away the winter. *Nat. Geog. Mag.*, 103:273-280.
- Lister, R. 1972. Whip-poor-will now a houseguest. *Edmonton Journal*, Jan. 20, p. 26.
- Marshall, J. T., Jr. 1955. Hibernation in captive goatsuckers. *Condor* 57:129-134.
- Reilly, E. M., Jr. 1968. The Audubon illustrated handbook of American birds. Edited by O. S. Pettingill, Jr., McGraw-Hill Book Co., New York, 524 pp.
- Salt, W. R., and A. L. Wilk. 1966. The birds of Alberta. Second (revised) edition. Dept. Ind. & Dev., Gov't of Alberta, Edmonton, 511 pp.
- Thorburg, F. 1953. Another hibernating Poor-will. *Condor*, 55:274.

#### SASKATCHEWAN CHRISTMAS BIRD COUNT 1972

List the number of each bird species seen on the One Best Day from Saturday, December 16, 1972, through Monday, January 1, 1973, inclusive. In addition, list number of individuals of other species observed during the above dates (giving date for each).

See March 1972 *Blue Jay* for examples.

Send reports before January 15, 1973, to Mrs. Mary Houston, 863 University Drive, Saskatoon.



# UNUSUALLY LARGE FLOCK OF KNOTS AND RUDDY TURNSTONES FEEDING IN STUBBLE FIELD

by **Fred W. Lahrman**, Saskatchewan Museum of Natural History, Regina

On May 21, 1972, while observing birds at the north end of Last Mountain Lake, I was surprised to discover a large flock of shore birds feeding on a burned-over stubble field of Durum wheat. The flock was huge and I estimated it must have contained at least 5,000 birds.

I was even more surprised when I discovered that it consisted mainly of Knots and Ruddy Turnstones for I do not recall seeing these species feeding on dry land before. There appeared to be slightly more Knots than Turnstones. Other birds noted feeding on the field were 12 Black-bellied Plovers, a few Ring-billed Gulls, Franklin's Gulls, approximately 15 Pintails and a pair of Widgeons.

The field was located approximately  $\frac{1}{2}$  mile west of the lakeshore and southeast of Liberty, and the birds were observed between 7:30 and 8:00 p.m. They presented a lovely view as they moved busily over the ground,

feeding as they went along. They often burst into sudden flight as shorebirds will and after erratically flying about in their twisting formation, they would settle on a different part of the field sometimes separating into two or three groups, and at other times uniting into one again.

Earlier in the afternoon I had noticed flocks numbering up to 30 or more birds feeding along the lakeshore and flying northwards up the lake. I do not know why they chose this certain field or what particular food attracted them.

In previous years, I had noted that the week of May 20 was the time when the peak of the migration of these birds passed through, but I have never seen such large numbers as this.

Also noted in larger numbers than usual were Stilt Sandpipers of which flocks of hundreds were seen feeding in shallow bays along the lakeshore and nearby sloughs.

## TWELFTH ANNUAL NESTBOX REPORT OF THE BRANDON JUNIOR BIRDERS

by **John Lane**, 1701 Lorne Avenue and **Randy Bauman**, 431 17th Street, Brandon, Manitoba

Since our last report our club has built 375 more nestboxes and had another 125 donated by J. Plum and H. Watson. With the aid of an open winter all 500 were set out by last Spring, repeated trips being made during both Christmas and Easter vacations. This brings our overall total to 3500 nestboxes set out since 1959, of which we estimate 250 as no longer habitable. Our nestlines now extend over 1000 miles of highway and railway. Many Mountain Bluebirds and the earlier Eastern Bluebirds were appearing along our nestlines by mid-

March, and we found the first eggs of both in late April. Cross-breeding between the two species continues to increase, three cases of Eastern males mated to Mountain females being noted. In addition, two more male hybrids were found, in each case mated to Mountain females. The first instance occupied Nestbox 1238, east of Carberry on Highway No. 1; his mate laid and hatched five eggs and raised the nestlings without aid since the hybrid father disappeared when the young first appeared. The other hybrid was found at Nestbox 129 southeast of



Griswold, mated to a Mountain hen which we had banded last year as a juvenile in another nestbox just 1½ miles away. After the five eggs hatched at this second nest, we set up a blind and took many pictures, mainly of the male bluebird, since he was a most unusual looking specimen: in addition to an extremely deep blue back and blue throat, he had much chestnut down his flanks, raising the question as to whether he might be a cross between the Mountain and Western Bluebirds.

The "Southeast Line" under Ed Robinson's direction listed 58 bluebird nestings from 100 nestboxes, an excellent percentage. The "Southwest Line" with Stan Giles and Art Michie in charge had an equally good percentage of success and in addition one of the nests in this area held the first Cowbird's egg ever found on our nestlines. We are sorry to report that the Rev. H. Dykman, who started our "Northwest Line" several years ago, has moved with his family to B.C., and his extensive nestline, running from south of Kenton north to Hamiota, west to Miniota, and south to Hargrave, has now been added to our main complex.

The banding of bluebirds again occupied much of our time this summer. Beginning in late May we banded until early August with a total of 4162 bluebirds. Of this total, 3475 were Mountain Bluebirds, 662 Easterns, and 25 hybrids. West of Brandon the malady which struck the first-brood young in 1970, as reported in *Blue Jay*, Dec., 1970, recurred this summer in the same areas. An estimated 100 nests were affected and 450 young bluebirds died, including the first two broods of hybrids. Specimens sent to a laboratory in Winnipeg for tests failed to reveal any concrete causes, but specimens of a small fly which we invariably found sucking blood from the young in the affected nests were identified as the common black-fly, and we now believe these, rather than some poison spray, to be the cause of the epidemic. In addition to these newly-established enemies of the bluebirds, we found a flying squir-

rel in one nestbox, and paper-making wasps which had taken over in another. These insects completely shrouded the box in their grey paper, then built their tiers of combs inside. In areas of evergreens porcupines are becoming a nuisance by climbing fenceposts and chewing up those nestboxes which are partly built of plywoods; we have been told it is the glue they are after. Deer mice, House Sparrows, House Wrens, and several types of ants continue to invade our nests, with both mice and sparrows on the increase. Starling have not become the menace that we feared, possibly because we are now installing smaller holes over the normal nesthole in areas where this species threatens. Our total nestings for 1972 are:

Mountain Bluebirds .....	715
Eastern Bluebirds .....	175
Crossbred Bluebirds .....	5
Tree Swallows (EST.) .....	1975
House Sparrows (EST.) ....	100
House Wrens (EST.) .....	45
Starlings .....	12
Deer Mice (EST.) .....	110
Red Squirrels .....	15
Flying Squirrel .....	1
Chipmunk .....	1
Paper-making Wasps .....	1
Nests damaged by	
Porcupines .....	22

ANNUAL REPORT ON THE  
INDIAN HEAD BLUEBIRD TRAIL

An additional 200 nest boxes were set out last spring, bringing the 10-year total to over 1,400 houses. Two new trails were established; one runs southeast of Regina along highway No. 16 to highway No. 35, then north on No. 35 to the Trans-Canada Highway. The other trail runs northwest of Regina on highway No. 11 to Lumsden, then north on highway No. 20 along the east side of Last Mountain Lake past Silton.

There were about 250 nests of Mountain Bluebirds in the houses this year, an increase of some 50 nests over last year. About 1,000 young

(Continued on page 253)



# ABERRANT SUBCAUDAL SQUAMATION ON A SPECIMEN OF THE BULL SNAKE

by **George B. Pendlebury**, 203, 820 - 5th Ave. S.W., Calgary, Alberta

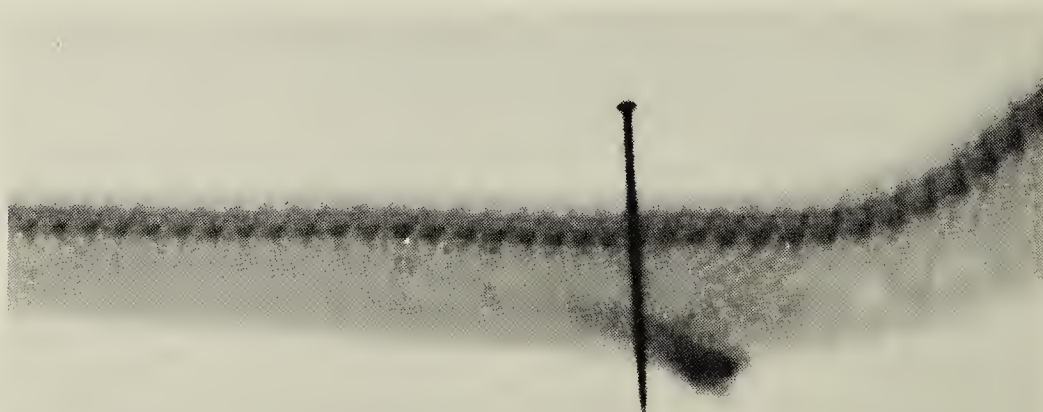
Subcaudal squamation on the bull snake *Pituophis melanoleucus sayi* normally consists of a series of paired scales. A specimen with anomalous squamation was found by Mr. W. E. McKay, Director of the Calgary Zoo, on the Trans-Canada Highway 16 km east of Tilley, Alberta, on August 20, 1972.

The specimen (GBP-72-2), is an adult male with a snout to vent length of 881 mm and a total length of 1032 mm. Immediately posterior to the vent there are a pair of subcaudals that have failed to meet medially. The resulting space is occupied by a small third scale. These scales are followed by five single subcaudals (Fig. 1).

In order to verify that it is the squamation and not the location of the vent that is anomalous, the specimen was X-rayed to locate the position of the cloaca with respect to the internal structure. X-ray photographs reveal that the structure-vent relationship is normal (Fig. 2), and that the scales do constitute the anomaly.



Fig. 1. Ventral view of a portion of *Pituophis melanoleucus sayi* showing vent, partially everted hemipenis and aberrant subcaudal squamation.



X-ray photo by Cheryl Pendlebury

Fig. 2. X-ray photograph of *Pituophis melanoleucus sayi* with aberrant subcaudal squamation. The pin marks the posterior margin of the anal plate. Shot at 1/10 sec., 100 ma., and 40 kvp on a Picker 200 ma. X-ray machine.



# BIRDS AND MAMMALS OF THE PINHORN PROVINCIAL GRAZING RESERVE\*

by **Hugh C. Smith**, Provincial Museum and Archives of Alberta, Edmonton

The Pinhorn Provincial Grazing Reserve, a 76,760-acre tract of land located in townships 1 and 2, ranges 7 and 8, west of the 4th meridian (Figure 1), is classified by Wyatt and Newton (1941) as virgin land. The Alberta Department of Lands and Forests administers the Reserve, and grazing leases are granted to local ranchers and farmers. During the summer approximately 3,000 head of cattle are run on this range, (unpublished, Department of Lands and Forests).

The area can be briefly described as a gently rolling grassland, sloping from south to north, with an elevation of 3,565 feet at the United States border to 3,000 feet at the northern boundary of the Reserve. The Milk River has cut a valley through the prairie that is over 400 feet deep and one mile wide. Several deep coulees enter the main river valley. The valley sides, with exposed bedrock and a highly eroded soil, are classified by Wyatt and Newton (1941) as badlands. For a more detailed description of the topography and climate of southeastern Alberta refer to Rand (1948), Soper (1949), and Lewin (1963).

Several distinctive habitats are found on the Reserve. Cottonwood (*Populus sargentii*), willow and rose grow along the banks of the Milk River where typically Mourning Dove, Yellow Warbler, Bullock's Oriole, and Rufous-side Towhee are found. Deer mice and mule deer are regularly observed in the area.

The wide, alluvial valley floor, with the dominant sagebrush (*Artemisia cana*), winterfat (*Eurotia lanata*), and greasewood (*Sarcobatus vermiculatus*), has little bird life compared to the cottonwood - willow - rose habitat. The

Western Meadowlark is the most common bird of this area, but the Brewer's Sparrow is also encountered here. Among the sagebrush bushes rattlesnakes and garter snakes are found.

The eroded soils and steep sides of the valley deter many plants from occupying this habitat, but greasewood and juniper (*Juniperus horizontalis*) are two that do occupy it. Rock Wren, Mountain Bluebird and Say's Phoebe are regularly found here.

The prairie level is dominated by grasses with spear grass (*Stipa comata*), wheat grass (*Agropyron* spp.), June grass (*Koeleria cristata*), and blue grama grass (*Bouteloua gracilis*) the characteristic species present. Horned Larks and Chestnut-collared Longspurs are the most common birds of the grassland, but Ferruginous Hawk, Sharptailed Grouse, Sage Grouse, Long-billed Curlew, and Upland Plover are typically found here. The pronghorn, coyote, rattlesnake, bullsnake, and garter snake also occur in this habitat.

Water resources on the Reserve are alkali sloughs, man-made dugouts and reservoirs, and the Milk River. Willow fringes the borders of many of the dugouts and reservoirs. Mallard, Pintail, Wilson's Phalarope, Red-winged Blackbird and muskrat frequent these fresh water bodies; American Avocet and Willet prefer the alkali sloughs; while Great Blue Heron, Spotted Sandpiper, and beaver are seen along the Milk River.

## Previous Surveys of Southern Alberta

Bird and mammal surveys of southern Alberta have been conducted by Williams (1946); Soper (1946); and Rand (1948). Regionally, Soper (1949) reported on the birds and mammals of the former Nemiskam National Park, a similar area 30 miles northwest of the Pinhorn Provincial Grazing Reserve.

\*By Hugh C. Smith, Natural History Contribution Number 8 of the Provincial Museum and Archives of Alberta.



Field trips to the Pinhorn Reserve were made by Provincial Museum staff in connection with exhibit studies in 1968, 1969, and 1970, and lasted from two to nine days. Four days (May 12 to May 15) were spent on the north section of the Reserve in 1969; in 1970 six days were spent on the south section and three days on the north section (May 26 to June 3). Field notes by M. J. Hampson, J. Keizer, D. A. E. Spalding and the author constitute the basis for this paper. There are 98 species of birds and 13 species of mammals recorded for the Reserve. These do not represent all the species that may occur there, as no trips were made during either the spring or fall migrations, or during the winter. No systematic trapping program was carried out to sample the small mammal population.

The Pinhorn Reserve is divided into north and south sections by the Milk River, and for ease of reference I have called these the north and south Pinhorn Reserve. Several records are listed for nearby localities outside the Reserve.

The species list follows the nomenclature and arrangement of the *Checklist of North American birds* (A.O.U., 1957).

### Acknowledgments

I would like to thank the following people who kindly read this manuscript, and for the many suggestions they offered: M. J. Hampson, J. O. Hrapko, D. A. E. Spalding and J. E. Storer; G. A. Frasier for drawing the map; and the manager and staff of the Pinhorn Grazing Reserve for permitting us to camp on the Reserve and carry out our programs.

## SPECIES LIST

### BIRDS

**Red-necked Grebe.** One was seen on a reservoir, south Pinhorn Reserve May 28, 1970. Rand (1948) considered this species uncommon and neither Williams (1946) nor Soper (1949) recorded it.

**Eared Grebe.** Seen twice in 1970: two, May 28, south Pinhorn Reserve,

and three, May 29, near Philip Coulee. Both Rand (1948) and Williams (1946) considered it common, but Soper (1949) did not mention it.

**Great Blue Heron.** On May 13, 1969 and May 27, 1970, single individuals were seen flying along the Milk River. Rand (1948) reported it as an uncommon summer resident.

**Canada Goose.** Common resident. On May 14, 1969, two nests were found near dugouts. One nest that was examined contained seven eggs. Pairs were seen daily along the Milk River. In 1970 flocks of 19, 2, and 4 flew over our campsite.

**Mallard.** Common resident. Found on every body of water. They doubtless nest around permanent water in the area.

**Gadwall.** Fairly common in 1970. Small groups were seen on reservoirs, south Pinhorn Reserve, and along the Milk River. Only one observation in 1969: May 14, one on a dugout, north Pinhorn Reserve.

**Pintail.** Probably the most common duck. Two nests, south Pinhorn Reserve: one containing eight eggs, May 26, 1970; another with five eggs, May 31, 1970.

**Green-winged Teal.** Recorded only once: May 28, 1970, a number on a reservoir, south Pinhorn Reserve.

**Blue-winged Teal.** Observed in all bodies of water in 1969 and 1970. Both Williams (1946) and Rand (1948) considered it common.

**Cinnamon Teal.** A male was seen on a dugout, north Pinhorn Reserve, May 12 and 14, 1969. Neither Williams (1946) nor Rand (1948) list this species. Salt and Wilk (1956) considered it a scarce summer resident that may breed in southern Alberta.

**American Widgeon.** Common, seen regularly in 1969 and 1970 on most bodies of water. No doubt breeding, as several pairs were noted.

**Shoveler.** Common on most bodies of water. Pairs and small flocks were observed daily in 1969 and 1970.

**Lesser Scaup.** In 1970 flocks were seen on reservoirs, south Pinhorn Re-



serve; however, only one was seen in 1969.

**Turkey Vulture.** On June 3, 1970, one was closely observed on a fence post by T. C. Wyn-Evans, botanical assistant. Soper (1949) does not record this species for Nemiskam National Park; Rand (1948) does not include it; Williams (1946) recorded one on the Montana side of the Milk River.

**Cooper's Hawk.** One was observed on May 13, 1969, in the valley of the Milk River.

**Swainson's Hawk.** One, June 5, 1968, vicinity of the north Pinhorn Reserve. Williams (1946) considered it common between Coutts and Aden, an area slightly west of the Pinhorn Reserve. Rand (1948) stated that it was not common in 1945; and at Nemiskam National Park, Soper (1949: 177) said it was "far from common in the district."

**Ferruginous Hawk.** Not common but seen occasionally throughout the area. A nest with three eggs located May 31, 1970, south Pinhorn Reserve. Williams (1946: 51) claimed it the "commonest bird of prey," Soper (1949: 177) said it was the "common hawk of the park." Rand (1948: 16) mentions seeing six birds in an area from the "Dominion Range Station, south to Milk River, and east to the Wild Horse." This area is just east of our study area.

**Golden Eagle.** Three seen June 5, 1968, near the north Pinhorn Reserve. In 1970, one, near the Aden Post Office, and two near Philp Coulee. Williams (1946) cites observations of single birds at various places, and Rand (1948) mentions Waterton Lakes Park as the only locality where he saw it. Soper (1949) does not record it for Nemiskam National Park.

**Marsh Hawk.** Not common, although hawks of this species were seen daily in 1969 and 1970. Rand (1948) did not consider it common in the area between Brooks to Milk River. Williams (1946) recorded it as fairly common in 1924. Soper (1949) noted it in Nemiskam National Park.

**Prairie Falcon.** One was seen over the Milk River valley in 1968 and

another in 1970. A pair was observed in the vicinity of the Lost River in 1969. From their behavior it appeared that they had a nest nearby.

**Sparrow Hawk.** Seen once in 1969 and 1970, along the river flats. One was seen in 1968 flying over the prairie near the rim of the Milk River valley. To Williams (1946) it was a common bird in 1923 and 1924; however, Rand (1948) saw only a few in 1945. Soper (1949) does not mention it for Nemiskam National Park.

**Sharp-tailed Grouse.** In 1969 and 1970 dancing grounds were found, and a number of birds were encountered at both places. In 1969, a dancing ground was under observation for four days, north Pinhorn Reserve. Counts of 9 and 13 birds were made on two occasions. In 1970, near Philp Coulee, south of the Milk River, another dancing ground with 15 to 20 birds was found.

**Sage Grouse.** In 1969, one was seen in the study area, and others were seen nearby. None was seen in 1970.

**Ring-necked Pheasant.** Several were heard along the Milk River in 1969. On May 26, 1970, six cock pheasants were seen in the vicinity of the Aden Post Office. Whenever we were along the Milk River pheasants could be heard calling.

**Gray Partridge.** Two were seen May 27, 1970, south Pinhorn Reserve.

**Killdeer:** Seen on the north Pinhorn Reserve, May 14, 1969. In 1970, south of the Milk River, we considered them common. Recorded May 26 at the Pinhorn Post Office; May 26 at a reservoir, south Pinhorn Reserve; and along the Milk River, May 30. Williams (1946), Rand (1948), and Soper (1949) all considered it common.

**Black-bellied Plover.** On May 30, 1970, a straggler was seen on a slough, south Pinhorn Reserve.

**Long-billed Curlew.** Not common, but seen regularly. One was seen north Pinhorn Reserve, June 5, 1968; two, in the same area, May 15, 1969. In 1970, observed: May 26 near the Aden Post Office; May 29, three near Philp Coulee; and June 2, two, north Pinhorn Reserve.



**Upland Plover.** On May 29, 1970, near Philp Coulee two were collected and two others seen.

**Spotted Sandpiper.** One or two were seen daily along the Milk River in 1969 and 1970. One was seen at the Aden border crossing on May 26, 1970.

**Willet:** Common around dams and sloughs, south Pinhorn Reserve. Several were seen May 28, 1970, flying past our campsite. On the north Pinhorn Reserve, one was seen May 13, 1969, and two on June 2, 1970.

**Marbled Godwit:** Marbled godwits were seen only on the north Pinhorn Reserve: two on May 14, 1969, and one on June 2, 1970. Rand (1948) found it common in the Brooks area but did not see it elsewhere.

**American Avocet.** Common around alkali sloughs, south Pinhorn Reserve. Fourteen were seen on May 15, 1970, north Reserve.

**Wilson's Phalarope:** The most common shorebird, present on every body of water. Two nests, with four eggs each, were found on the south Pinhorn Reserve in 1970.

**California Gull.** Although gulls were regularly seen in the area, on only one occasion was there a positive identification of this species; one was seen on June 2, 1970, on the north Pinhorn Reserve.

**Ring-billed Gull.** Four were seen on May 29, 1970, near Philp Coulee, and

four along the Milk River near the Reserve headquarters on May 20, 1970.

**Black Tern.** On May 15, 1969, four were seen, north Pinhorn Reserve; May 28, 1970, several on a reservoir, south Pinhorn Reserve.

**Mourning Dove.** A common resident of the Milk River valley. Seen daily flying from the river valley to trees in a farm shelter belt nearby. On June 5, 1968, a nest with one egg was found.

**Great Horned Owl.** Near the Pinhorn Reserve headquarters, one was seen May 30, 1970, and a dead one was found nearby.

**Burrowing Owl.** Seen on only two occasions in 1970; one, June 1, north of the Aden bridge, and three June 2, near the Milk River east of Comrey.

**Belted Kingfisher.** One was seen on May 30, 1970, flying along the Milk River.

**Flicker.** Flickers, with both red and yellow wing linings, were observed along the Milk River. As none was collected, no determination can be made regarding hybridization.

**Red-headed Woodpecker.** On June 27, 1969, in the vicinity of the Lost River, one flew across the road in front of our truck.

**Downy Woodpecker.** Single birds were seen twice along the Milk River, once on May 30, 1970.

**Eastern Kingbird.** Not uncommon south of the Milk River, although not seen in any numbers. In 1970 single

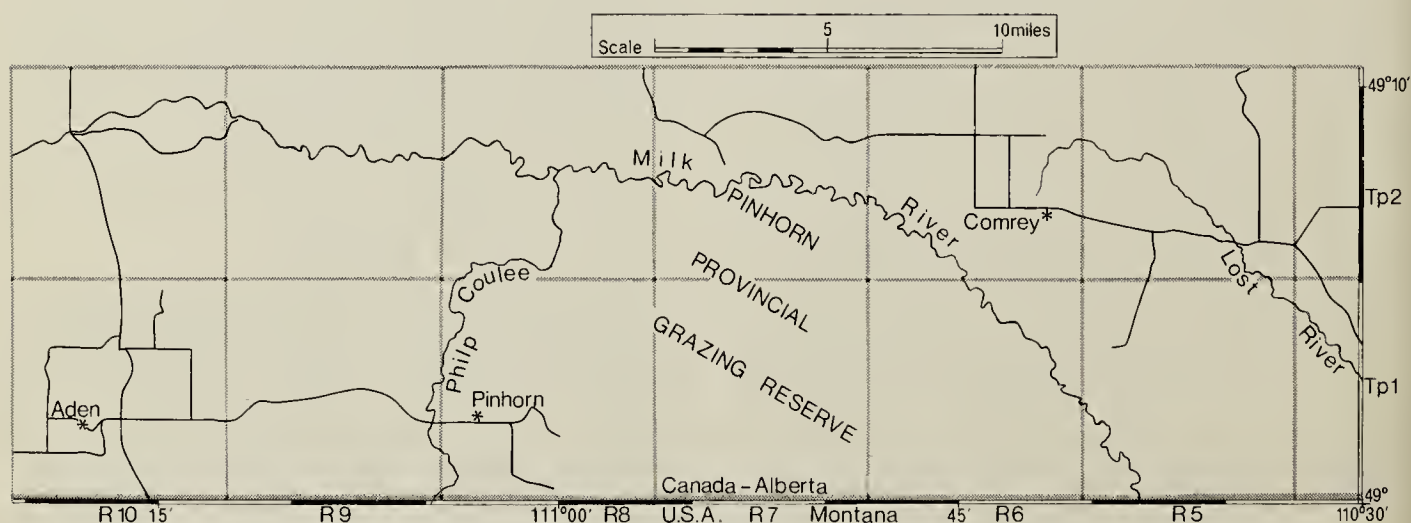


Fig. 1. Map of Pinhorn Provincial Grazing Reserve in southeastern Alberta.



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EXHAUSTIVE BOOKS LISTS were included in "The Blue Jay" for the issues of June and September 1971, and the SNHS Newsletter of November 1972; please refer.

-o-

SNHS CREST DECAL: The crest of the Society in its official colours of blue, gold and black, is available as a car window decal - 35¢ each, 4 for \$1.00.

HASTI-NOTES AND CHRISTMAS CARDS

- Hasti-notes: (1) Birds at nest, colour, 10 (2 of each design) - \$1.00  
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(3) Floral Emblem and Scene: Saskatchewan Lily, Alberta Rose, Manitoba Crocus, or 1 each of 12 provinces and territories - \$1.00 per pkt. of 12.
- Xmas Cards: (1) Floral Emblem and Scene (as (3) above) with greeting; \$1.00.  
(2) Hawthorn Berries on Snow - Kodachrome by Doug Gilroy, 15 cards with envelopes \$1.00.

NOTEPAPER AND CALENDARS

- Notepaper: (1) Floral Emblem and Scene (as (3) above) \$1.00
- Caleendars: (1) "Saskatchewan 1973" published by "The Western Producer" - out of print at the press but we have a small supply - \$1.50 each.  
(2) The Oxborough Calendar - 13 appealing faces of Canadian Indian children by Dorothy Oxborough, nationally known painter of Canada's Indian and Eskimo children - \$1.25 each.  
(3) Canadian Rockies calendar - 12 magnificent mountain scenes by Canada's finest photographers - \$1.25 each.

BIRD BOOKS

BIRDS OF ARCTIC ALASKA by Alfred M. Bailey, \$5.60, 317 pp., 100 photos. Dr. Bailey's experiences cover 25 years of collecting in the field. This book briefly describes more than 200 species in the area.

BIRDS OF ALASKA by Ira Gabrielson and F. C. Lincoln, \$15.80 US, 933 pp., 10 col. pl., 1959. This is the definitive work on Alaskan birds, containing as it does detailed descriptions of all the region's species. Much other relative data.

BIRDS OF FLORIDA by George S. Fichter, \$7.20, 1971, 114 pp., 57 photos (4 in col.), 230 drawings. This popular mecca for birdwatchers has come up with a bird book of its very own! If Florida is in your future this will be a useful addition to your reference library.

BIRDS OF GUATEMALA by Hugh C. Land, \$10.00, 380 pp., 43 col. pl., range maps and country maps, 5 $\frac{1}{2}$ x7 $\frac{1}{2}$ . This small country has more than 660 species of birds. The late Dr. Land spent much time in the country, studying the bird life intensively. The book is sponsored by the International Committee for Bird Preservation, Pan-America Section.

BIRDS OF NORTH AFRICA by R. D. Etchecopar and F. Hue, \$25.00. A magnificent, large, beautifully illustrated book dealing with the huge and varied region which is home to many species of birds.

BIRDS OF NORTH AMERICA AND HOW TO PHOTOGRAPH THEM by Perry Slocum, \$12.95 US, 224 pp., 100 species in colour, with over 80 photos at nest. This book by one of the best photographers around, describes seven methods of bird photography. It has something for everyone who ever aimed a camera at a bird.

BIRD STUDY by Andrew J. Berger, \$5.00, 400 pp., 176 illus., 1971 Dover reprint



BIRD STUDY (cont.)

of the 1961 ed. A handy guide for youngsters and other beginners, covering field identification, habitat preferences, song, courtship antics, nesting behaviour of many birds.

FIELD GUIDE TO THE BIRDS OF NEW ZEALAND by R. A. Falla and others, \$8.50 US, 254 pp., 18 plates (6 in col.), maps, 1967, cloth. Not too many birders reach New Zealand but those who do will appreciate this excellent identification guide to the 200+ species there.

FIELD GUIDE TO THE BIRDS OF THE WEST INDIES by James Bond, \$8.95 US, \$11.00 Can. 1971 2nd ed. 256 pp. 94 birds in colour, 186 in b.w. More than 400 species described known to occur regularly in this popular vacation region.

GIFTS OF AN EAGLE by Kent Durden, \$6.95, 159 pp., illus. Written with warmth and love, this book is a moving story of the relationship between Lady, a Golden Eagle, and the family with whom she lived for 16 years in southern Calif. The author writes: "The years with Lady were rich years. They left us with memories of a multitude of incidents that cover a broad spectrum of emotional experiences. Each of these enriched our lives immensely. . . they are gifts to us and now they are yours."

OKLAHOMA BIRDS by George M. Sutton, \$12.50 US. A great American ornithologist presents all that is now known about the ecology and distribution of Okla. birds. 400+ species are discussed. A sound reference volume and an indispensable guide if this important area is in your birding future.

THE ORIGIN OF BIRDS by Gerhard Heilmann, \$4.75, 216 pp., 143 illus. (Dover reprint 1972). This classic gives an excellent account of the origin of birds.

KEY TO NORTH AMERICAN WATERFOWL by S. R. Wylie & S. S. Furlong, \$4.20. 32 pp. 48 col. paintings, many text drawings, 1972. This book is proving to be popular with outdoors people as it is printed on a waterproof plastic. It was intended to be always available to hunters, even in the rain, as the publisher says ". . . to help save rare species by encouraging the sportsman to learn the difference between a Fulvous Tree Duck and a Vulture!"

LIFE HISTORIES OF NORTH AMERICAN BIRDS by A. C. Bent; Dover reprints of these indispensable classics for bird students:

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		WOODPECKERS.....\$3.50

PLANT AND TREE BOOKS

CACTI OF THE SOUTHWEST: Texas, New Mexico, Oklahoma, Arkansas and Louisiana, by Del Weniger, \$25.00 US, 328 pp., 183 col. photos, 9½x11½, 1972. A lovely new book to help those of us lucky enough to be able to explore the southwestern states when the cacti are blooming, but it is also for the cactus gardener as well as the cactus hunter. Dr. Weniger has given us a beautiful illustrated account of all the cacti found there. His work has the distinction of being the first detailed study to picture in full colour photos the cacti of the region which has long been noted for its many small and exquisite forms. The casual student will find identification of most easy from the illustrations and for the others there are detailed keys.

FORESTS OF NEPAL by J. D. A. Stainton, \$17.50. Nepal remained almost completely closed to western travellers until 1949. The author was a member of an early British botanical expedition after which he continued on his own, and over the next 15 years made 18 journeys to the region. 7x10, 5 maps, 156 col.pl

TREES OF NORTH AMERICA by C. Frank Brockman; cloth \$6.95, limp \$4.50, 280 pp. This is a field guide to the identification of 594 of some 865 species native to North America north of Mexico. Native woody plants that regularly attain a height of 20 feet are included as have major introduced and naturalized species but many others are mentioned. A companion to "Birds of North America" (same prices) it depicts species in full colour, with range maps.

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WILD FLOWERS OF THE PRAIRIES by J. B. Neufeld, \$3.50, 28 pp. A fine book which has captured 28 prairie flowers in full colour reproduced with exceptional fidelity. A useful book as a field guide, a book of appreciation, and especially good as a gift for overseas friends. Each plate is accompanied by a short description and local and scientific names are given.

WILD FLOWERS OF THE WORLD: text by Brian D. Morley, 1,000 beautiful plants painted by Barbara Everard, \$12.50, 432 pp., 9 $\frac{1}{4}$ x12, SPECIAL PRICE \$12.50. A beautiful and authoritative volume which describes a huge number of wild flowers from every region and climate of the earth. Precise scientific description is masterfully combined with information of an historical, anecdotal, and practical nature to create a definitive study of wild flowers. The 1,000 accurate paintings are exquisitely reproduced in 192 colour plates.

### MAMMAL BOOKS

BABOON ECOLOGY, by Stuart Altmann and Jeanne Altmann, \$12.00 US, 1971, 220 pp. illus. 7x9 $\frac{1}{2}$ . Baboons are among the most widespread, abundant, and adaptable of the primates. Like early man, baboons made a transition from an arboreal to a terrestrial mode of life. This first complete study of baboons by one of the world's leading primatologists presents exciting advances in theory and methodology, and stimulating new hypotheses are put forward.

THE BOBCAT OF NORTH AMERICA by Stanley P. Young, \$7.50 US, \$9.50 Can. This is an outstanding addition to the author's distinguished writings as a biologist and Director of Bird and Mammal Laboratories, U. S. Fish and Wildlife Service. It is a complete scientific study of the Bobcat, interestingly spiced with anecdotes from the author's own experiences.

CHIPMUNK PORTRAIT by B. & H. Henish, \$6.75, 98 pp., 45 photos, 28 drawings, cloth. An illustrated study of the delightful chipmunk, its discovery in America by early explorers, and its role in the art of the Indian. A scholarly book, extremely well written.

THE DEER AND THE TIGER: A Study of Wildlife in India, by Geo. B. Schaller, 1967 \$10.00 US, 370 pp., illus. 6 $\frac{1}{4}$ x9 $\frac{1}{4}$ . A unique scientific report of free-living animals often hunted but seldom observed, and never before so accurately described - three kinds of deer, blackbuck, gaur and tiger.

DEER OF NORTH AMERICA by Walter P. Taylor (ed.), \$12.50 US, \$15.00 Can. 696 pp. 63 illus., including full colour reproductions of two originals by Walter A. Weber. This comprehensive volume summarizes many years of intimate study by leading experts and is the only modern book to cover fully the deer of North America. Anyone involved in wildlife will be appreciative of the valuable information contained in this book.

DEER OF THE WORLD by Kenneth Whitehead, \$17.50, 176 pp., 7 $\frac{1}{2}$ x10. Of the forty living species of deer no less than fifteen are included in "The Red Book - Wildlife in Danger" (\$19.00). Dr. Whitehead's book is, therefore, not only an important book of reference to the world's Cervidae, but also a book of very great value to the ever-increasing number of those involved in saving the world's vanishing wildlife.

LEMUR BEHAVIOR: A Madagascar field study, by Alison Jolly, \$9.00 US, 1966, 187 pp., illus., 6 $\frac{1}{4}$ x9 $\frac{1}{4}$ . This field study gives a full description of the ecology and social behavior of two species of lemurs. This exemplary work consists of detailed observation of lemur behavior, both in troops and as individuals, in search of clues to the evolution of primate social behavior.

THE MANAGEMENT OF WILD MAMMALS IN CAPTIVITY by Lee S. Crandall, \$15.00 US, 1964 761 pp., illus. 6 $\frac{1}{4}$ x9 $\frac{1}{4}$ . As the title indicates this book is aimed particularly at zoo managers and their staffs but should be on the shelves of all who keep wild mammals for any reason.

THE MOUNTAIN GORILLA: Ecology and Behavior, by Geo. B. Schaller, \$11.00 US, 432 pp., illus., 6 $\frac{1}{4}$ x9 $\frac{1}{2}$ , 1963. The most complete study ever made of a free-living primate. This superbly documented report describes, tabulates, analyzes, and evaluates every aspect of a gorilla's life.

MOUNTAIN SHEEP: A Study in Behavior and Evolution, by V. Geist, \$15.50 US, 1971 432 pp., 7x9 $\frac{1}{2}$ , illus., cloth. This is the scientific record of a unique first-hand field study of free-living mountain sheep. The close observation of these animals was done at all seasons by the author, who travelled for four years with bands of the various species of sheep in western Canada.

MUSKRATS AND MARSH MANAGEMENT by Paul L. Errington, \$5.00 US, \$6.00 Can. This book is an outgrowth of the author's 40-year interest and experiences in trapping muskrats and is intended to be informative, useful, add to the perspective of the reader, and influential in reducing abuses and waste in the harvesting of muskrats for fur.



THE SERENGETI LION: A Study of Predator-Prey Relations, by Geo. B. Schaller, \$12.50 US, 1972, 472 pp., 24 pp. illus, cloth, 7x9½. This is the most comprehensive study ever made of the lion. The author's work, based on three years of study, describes the impact of the lion and other predators on the vast herds of prey species.

SOCIAL COMMUNICATION AMONG PRIMATES Ed. S. A. Altmann, \$15.00 US, 1967, 392 pp 6¼x9¼. Contributors to this symposium have given us a most interesting volume on animal social behavior by means of papers of uniform high quality. Their presentations are clear, their documentation complete, and their theoretical discussions stimulating.

SOCIAL ORGANIZATION OF HAMADRYAS BABOONS: A Field Study, by Hans Kummer, \$8.95 US, 1968, 189 pp., illus. This important field study provides the first accurate information about one species of free-living primates, the Hamadryas Baboon. This scientific monograph is for behavioral scientists and laymen interested in animal behavior. All critical events in Hamadryas society are documented by field photographs.

THE YEAR OF THE GORILLA by Geo. B. Schaller, \$8.50 US cloth, \$2.95 US paper. For those who enjoy reading of wild animals and primitive places, George Schaller has written an informal and exciting story of his two years of travel in East and Central Africa.

THE SPOTTED HYENA: A Study of Predation and Social Behavior, by Hans Kruuk, \$15.00 US, 1972, 368 pp., illus. 6¼x9½, cloth. This thoroughly illustrated study constitutes the first substantial field research on hyenas. The author took 3½ years to examine every aspect of hyena behavior and its impact on ungulate populations.

A ZOO MAN'S NOTEBOOK, by Lee S. Crandall (in collaboration with Wm. Bridges), \$4.95, 1966, 216 pp., illus. 6x9. General Curator emeritus of the New York Zoological Park, Mr. Crandall has worked for over 50 years with one of the world's largest captive collections of wild animals. This book has been hailed by biological scientists. The preservation of endangered species depends, as one approach, on the propagation in captivity of individuals, so we are all involved indirectly. A well written, appealing book.

#### OTHER NATURAL HISTORY BOOKS

ANIMAL BEHAVIOR by John Paul Scott (2nd ed. rev.), \$12.50 US cloth, \$3.25 US paper, 1972, 382 pp., illus. 5½x8½. The multi-disciplinary approach to animal behavior of the 1st ed. is augmented in the 2nd ed. by an updating of the material and a record of recent years of exciting growth in this increasingly important science. While the book is lively and entertaining it is also successfully used as a students' text.

ENCOUNTERS WITH ARCTIC ANIMALS by Fred Brummer, \$17.35. This large, profusely illustrated book, in col. and b.w., looks at all the animal life forms of the Arctic basin. An excellent text, with superb pictures, the book has been widely acclaimed.

FROM APE TO ADAM by Herbert Wendt, \$15.00 US, 292 illus. 19 in col. This is the story of the search for the ancestry of man, a unique word and picture look at 20 million years of our lives. It includes interpretations of the works of the most famous students of man, and illus. of tools, bones, weapons, ruins, cave paintings and sculptures.

THE FASCINATION OF REPTILES by Maurice Richardson, \$10.00 US, illus. with 31 b.w. drawings and 8 col. pl. This is a warm and affectionate book about a subject on which few authors can be objective. It is first-rate reading for anyone with an interest in herpetology, and a long-needed work that may help to counteract some of man's most firmly established and unreasonable prejudices.

INTRODUCTION TO THE STUDY OF ANIMAL POPULATIONS by H. G. Andrewartha (2nd ed.) \$7.50 US cloth, \$3.25 US paper, 1971, 5½x8½. This study considers how environment determines an animal's chance to survive and reproduce, thus influencing the distribution and abundance of the population to which the animal belongs. At each step the theoretical considerations are illustrated by reference to ecological case histories.

METHODS OF COLLECTING AND PRESERVING VERTEBRATE ANIMALS by R. M. Anderson, \$2.50 4th ed. rev. 1965, reprinted 1972, 199 pp., illustrated, paperbound.

NATURE'S HERITAGE, paperbound, \$4.95. Canada's national parks, a complete picture story of the great natural heritage of these marvelous areas depicted in fascinating colour.

PHOTOGRAPHING WILDLIFE by J.-M. Baufle and J.-P. Varin, \$15.00 US, 75 col. pl. A magnificently illus. indispensable guide for the nature photographer. It contains a wealth of material, from how to choose and use the right camera, lenses and film to building blinds and judging animal behavior. The text is enhanced with diagrams, tables and photographs that bring the subjects vividly to life. An authoritative and up-to-date volume.



birds were observed around farm shelter belts and along the coulees of the Milk River. In 1968 two flocks of seven birds were seen.

**Western Kingbird.** Seen once, on May 26, 1970. One was seen at Aden Post Office.

**Say's Phoebe.** Seen regularly along the sides of the Milk River valley, but never more than one or two at a time.

**Least Flycatcher.** Whenever there were willows these flycatchers could be heard calling. Recorded in both 1969 and 1970 from along the Milk River. One bird was collected on May 28, 1970.

**Western Wood Pewee.** Rand (1948) considered it common along the Milk River. We recorded it only once: May 30, 1970, one seen along the Milk River.

**Olive-sided Flycatcher.** One, May 10, 1970, seen along the Milk River.

**Horned Lark.** One of the most common species, encountered throughout the area. Two young were banded in 1970, one on May 28 and one on May 30, 1970.

**Violet-green Swallow.** Two were seen on June 1, 1970, flying over the Milk River valley. Not recorded by Williams (1946), Rand (1948), or Soper (1949).

**Tree Swallow:** Recorded along the Milk River, May 14, 1969.

**Bank Swallow.** Common locally. Seen at Philp Coulee, May 29, 1970, and again on May 29, 1970, and again on May 30, 1970, near the Pinhorn Reserve headquarters.

**Barn Swallow.** Two were seen on May 14, 1969, north Pinhorn Reserve; two, May 27, 1970, south Pinhorn Reserve. Not common on the prairies, as Williams (1946) records it on four occasions, Rand (1948) only once, and Soper (1949) once.

**Cliff Swallow.** Common and in colonies at the Aden Bridge on May 26, 1970, along Philp Coulee on May 29, 1970, and at various places along the Milk River.

**Black-billed Magpie.** Along the wooded banks of the Milk River, Magpies were fairly common in 1969 and 1970.

**Common Crow:** Recorded on only two occasions: May 14, 1969, north

Pinhorn Reserve; May 27, 1970, several, south Pinhorn Reserve.

**Black-capped Chickadee.** Found along the Milk River on the Pinhorn Reserve. On May 14, 1969, birds were seen carrying food, although no nesting site could be found. Two were seen May 27, 1970, south Pinhorn Reserve.

**House Wren.** Fairly common along the Milk River, recorded on May 13 and 14, 1969, and May 30, 1970.

**Rock Wren.** Along the coulees of the Milk River they were frequently encountered. We recorded them on June 6, 1968, May 14, 1969, and May 27, 1970.

**Catbird.** Williams (1946) and Rand (1948) stated that it was locally common, but we recorded it only once, May 30, 1970, near the Reserve headquarters along the Milk River.

**Brown Thrasher.** Reported twice in 1970: May 28, one was collected on the south Pinhorn Reserve near the United States border; May 30, one was seen near the Reserve headquarters.

**Robin.** Not common along the Milk River, recorded on May 13, 1969, and May 30, 1970.

**Swainson's Thrush.** On May 30, 1970, one was seen among willows along the Milk River near the Reserve headquarters. Williams (1946) recorded it, but was doubtful of its identity as it was only heard; Rand (1948) considered it a migrant in southern Alberta; and Soper (1949) does not record it for Nemiskam National Park.

**Mountain Bluebird.** Relatively common throughout the area. Adult and juvenile birds were seen June 27, 1969, near Lost River. On May 27, 1970, a pair was seen on the prairie, south Pinhorn Reserve; the male was collected.

**Sprague's Pipit.** Every day we were on the area, and at almost every stop we made on the prairie, they could be heard singing.

**Loggerhead Shrike.** Not common, seen occasionally throughout the area. June 5, 1968, a nest with 5 eggs; June 27, 1969, a family group along the Lost River valley.

**Common Starling.** May 26, 1970, a nest was located near a cabin, south



Pinhorn Reserve. Some were seen on May 30, 1970, near the Reserve headquarters. Not reported by Williams (1946), Rand (1948), or Soper (1949).

**Red-eyed Vireo.** One was seen near the Reserve headquarters, May 30, 1970.

**Yellow Warbler.** Relatively common and singing along the river flats where there were shrubby thickets. Sight records: May 14, 1969, and May 30, 1970, on the river flats, and May 26, 1970, at Aden Post Office.

**Myrtle Warbler.** One was seen on May 13, 1969, along the Milk River.

**Blackpoll Warbler.** A male was collected on May 13, 1969.

**Yellowthroat.** Fairly common along the Milk River. Recorded on the Pinhorn Reserve in 1969 and 1970.

**Yellow-breasted Chat.** One male was seen on May 30, 1970, near the Reserve headquarters.

**House Sparrow.** Common around farms and granaries. Recorded on May 26, 1970, at the Aden Post Office. Not seen on the Pinhorn Reserve.

**Western Meadowlark.** Common throughout the area. Found on the prairie level and on sagebrush flats along the Milk River. Recorded on May 13, 1969, and May 30, 1970, on the Pinhorn Reserve.

**Yellow-headed Blackbird.** A large flock was seen once, May 27, 1970, south Pinhorn Reserve.

**Red-winged Blackbird.** Found wherever there was water with emergent vegetation. In 1970, south Pinhorn Reserve, two nests were found. Four adult birds were banded on May 26, 1970.

**Baltimore Oriole.** One was seen at Aden Post Office on May 26, 1970.

**Bullock's Oriole.** Not common, but found nesting in cottonwoods along the Milk River near the Pinhorn headquarters. Two males were collected, May 27, May 30, 1970.

**Brewer's Blackbird.** Recorded only once, May 28, 1970, a small flock near a cabin, Pinhorn Reserve. Soper (1949) found them common in Nemiskam National Park, as did Williams (1946). Rand (1948) recorded small numbers

in the vicinity of the Dominion Range Station.

**Common Grackle.** Two were seen May 13, 1969, north Pinhorn Reserve. Not reported by Soper (1949) or Williams (1946). Rand (1948) recorded them as not uncommon but of local occurrence.

**Brown-headed Cowbird.** Seen daily around the range cattle; recorded, May 14, 1969, and May 28, 1970.

**Pine Grosbeak.** M. J. Hampson reported seeing an immature male May 30, 1970, along the Milk River near the Reserve headquarters.

**Pine Siskin.** A flock was seen along the Milk River on June 1, 1970.

**American Goldfinch.** Four were seen on May 30, 1970, at Aden Post Office.

**Rufous-sided Towhee.** In the thick shrubbery along the Milk River, towhees were common. Recorded: May 13, 1969 (one male collected); May 27, 1970 (two males collected); May 30, 1970.

**Lark Bunting.** Recorded once, two males near Pinhorn Post Office, May 26, 1970. This is in contrast to Williams (1946), Rand (1948), and Soper (1949) who reported it as common in their surveys.

**Savannah Sparrow.** One was seen May 31, 1970, south Pinhorn Reserve. This was our only record for this species.

**Baird's Sparrow.** Recorded: June 5, 1968, north Pinhorn Reserve; May 26, 1970, Aden customs port; near Philp Coulee, May 29, 1970, one collected.

**Vesper Sparrow.** Common throughout the area. Recorded on the north Pinhorn Reserve, June 5, 1968, and May 15, 1969.

**Lark Sparrow.** Not common, but recorded on the North Pinhorn Reserve, June 5, 1969, and on the south section May 27, 1970, one collected.

**Chipping Sparrow.** Three along the Milk River, May 14, 1969; four, at Aden Post Office, May 30, 1970.

**Brewer's Sparrow.** Seen along the Milk River and on the prairie. On May 27, 1970, one was collected.

**White-crowned Sparrow.** One, May 13, 1969, along the Milk River.



**McCown's Longspur.** Small flocks were seen, May 28, 1970, south Pinhorn Reserve. One was collected.

**Chestnut-collared Longspur.** Along with the Horned Lark, this was probably the most common bird in the area. Recorded in 1968, 1969, and 1970. Two were collected in 1970. Two nests were found on the south Pinhorn Reserve, on May 31, 1970, one had four eggs, the other had two young birds approximately three days old.

## MAMMALS

### Coyote.

*Canis latrans.* In 1969, two were heard on May 13. Two were seen in 1970: May 27, south Pinhorn Reserve; June 3, north Pinhorn Reserve.

### Richardson's Ground Squirrel.

*Spermophilus richardsonii.* The most notable feature of the fauna of the Pinhorn Reserve was the absence of these rodents. They were common at Manyberries, about 30 miles north, but entirely absent from the Reserve. One was seen June 1, 1970, north of the Aden Bridge.

### Pocket Gopher.

*Thomomys talpoides.* Tunneling by pocket gophers was evident on many earth dams in the area. One was collected on May 30, 1970, south Pinhorn Reserve. Soper (1946) records two occurrences, one west of Writing-on-Stone and another in Twp. 2, Rge. 9, just west of our study area.

### Olive-backed Pocket Mouse

*Perognathus fasciatus.* While driving the prairie trails at night we caught two pocket mice by hand, May 27, 1970, south Pinhorn Reserve. Soper (1946) does not mention this mouse as occurring in Alberta.

### Beaver.

*Castor canadensis.* Beaver trails and cuttings were seen at many places along the Milk River in 1969 and 1970.

### Deer Mouse.

*Peromyscus maniculatus.* In three nights in 1969, 20 were caught in traps. In 1970, during the night of May 26, several were caught by hand and released.

### Meadow Vole.

*Microtus pennsylvanicus.* On May 13, 1969, one was caught by hand. This was the only meadow vole we saw during our field work on the Reserve.

### Muskrat.

*Ondatra zibethicus.* On the south Pinhorn Reserve, muskrats were seen in several reservoirs. On May 27, 1970, two were trapped.

### Nuttall's Cottontail

*Sylvilagus nuttallii.* Fairly common along the Milk River. One was seen June 5, 1968, and several were seen and three collected May 27 and May 30, 1970.

### White-tailed Jack Rabbit.

*Lepus townsendii.* One was seen May 26, 1970, at Aden Post Office, and two were seen on the south Pinhorn Reserve on May 27, 1970.

### Mule Deer.

*Odocoileus hemionus.* Observed on several occasions both north and south of the Milk River: June 5, 1968, seven on the north Pinhorn Reserve; May 14, 1969, six seen near the Milk River on the north Reserve; May 29, 1970, two seen at Philp Coulee; and May 30, 1970, one seen on the south Pinhorn Reserve.

### White-tailed Deer.

*Odocoileus virginianus.* One was seen June 1, 1970, on the north Pinhorn Reserve.

### Pronghorn.

*Antilocapra americana.* Pronghorn were seen daily in 1969 and 1970.

## LITERATURE CITED

- American Ornithologists' Union. 1957. Checklist of North American birds. Fifth Ed., Baltimore, Maryland, U.S.A. pp. 691.  
Lewin, V. 1963. The herpetofauna of southeastern Alberta. Can. Field-Nat., 77:203-214.  
Rand, A. L. 1948. Birds of southern Alberta. Nat. Mus. Can., Bull 111, Biol. Series 37.  
Salt, W. R., and A. L. Wilk. 1966. The birds of Alberta. Dept. Industry and Development, Edmonton.  
Soper, J. D. 1946. Mammals of the Northern Great Plains along the International Boundary of Canada. Journ. Mamm., 27: 127-153.  
Soper, J. D. 1949. Notes on the fauna of the former Nemiskam National Park and vicinity, Alberta. Can. Field-Nat., 63:167-182.  
William, M. Y. 1946. Notes on the vertebrates of the Southern Plains of Canada, 1923-1926. Can. Field-Nat., 60:47-60.  
Wyatt, F. A., J. D. Newton, W. E. Bowser and W. Odynsky. 1941. Soil survey of Milk River Sheet. Dom. Dept. Agri., Exp. Farm Service, pp. 1-105.



# TWO NEW RECORDS OF LONG-EARED MYOTIS IN SASKATCHEWAN

by William J. Maher, University of Saskatchewan, Saskatoon

On June 11, 1969 Brian E. Felske found a bat in a crevice between two boulders on a south-facing slope of the South Saskatchewan River Valley on the Matador Field Station, near Beechy, Saskatchewan. The precise locality was Section 14, Township 20, Range 13, west of the third meridian. The specimen was a male with measurements: TL 81, T 39, HF 10, Ear 17, Tragus 11 mm., and is specimen No. 2713 of the University of Saskatchewan vertebrate collection. It has been identified by R. Peterson, ROM, as a Long-eared Myotis (*Myotis evotis*).

Southwestern Saskatchewan is the northeast corner of the range of this species. Although it was recorded 25 years ago in Rumsey, Alberta (Anderson, 1947) it was not identified in this province until 1960 (Nero, 1960). There is one subsequent published record of the species in Saskatchewan (Nero, 1963) and a third specimen, now in the Saskatchewan Museum of Natural History (R. Long, in *Litt.*), was taken at Big Muddy Lake on June 5, 1965.

The four records of this bat are all in the southwestern part of the province, the specimen reported here being the most northerly. All these records are from May and June, and it appears that this species may be a regu-

lar, if uncommon, summer visitor to the province. We could use more records of this bat.

The long-eared Myotis inhabits thinly forested to semi-desert areas. It is reported to roost in caves at night between foraging trips; but it roosts in day time in small groups in buildings and trees (Hall and Kelson, 1959; Barbour and Davis, 1969). The specimen reported here, as well as one previous one from Saskatchewan (Nero, 1963) were found under rocks, and this may be, in fact, the typical day time roosting site for the species.

Naturalists should be aware that this and two other small brown Myotis: Keen's Myotis (*M. keeni*) and Small-footed Myotis (*M. subulatus*), are known from only a couple of records from the province, and it would be useful to have more specimens of small brown bats preserved and identified (see Beck, 1958, and Nero, 1963).

## LITERATURE CITED

- Anderson, R. M. 1947. Catalogue of Canadian recent mammals. Bull. Nat. Mus. Canada, 102: v + 238 pp.  
Beck, W. H. 1958. A guide to Saskatchewan mammals. Sask. Nat. Hist. Soc., Special Publ. No. 1, 1-52 pp.  
Hall, E. R., and K. R. Kelson, 1959. The mammals of North America. Vol. I. Ronald Press. xxx + 625 pp.  
Nero, R. W. 1960. Long-eared Myotis found in Saskatchewan. Blue Jay, 18:181.  
Nero, R. W. 1963. A second record of the Long-eared Myotis bat. Blue Jay, 21:119.

# HOARY BAT PARTURITION DATE AND CAPTIVITY RECORD

by William J. Maher, University of Saskatchewan, Saskatoon

Very little is known about the Hoary Bat (*Lasiurus cinereus* Beauvois), the largest North American bat. This is in part because it is solitary, seldom enters buildings or caves and usually starts flying later in the evening than other bat species. Because of the scarcity of information on the hoary bat,

I thought that this record, based on one bat kept in captivity, would be of interest.

A female hoary bat was found hanging in a maple tree in a cemetery near Floral, Saskatchewan on June 24, 1969 by D. W. T. Whitfield and G. Michalenko. She gave birth to two young on





Photo by John Waddington

### Hoary Bat, June 28, 1969

June 25 or 26 in the animal room in the Department of Biology, University of Saskatchewan in Saskatoon. One young survived for about two weeks and died on July 11. The second young lived for about a month longer. The date of its death was not recorded. The female lived until December 28 and died after about six months in captivity.

The bats were kept in a 15-gallon aquarium provided with a water dish and a branch to hang on. The female refused to eat newly born mice and only accepted *Tenebrio* larvae and pupae with the pupae being definitely preferred. She was hand fed up to 30 *Tenebrio* a day; she never learned to pick up any food. Every two or three days some larvae were dipped in cod liver oil before they were fed to her.

The litter size of the species is always two, and parturition occurs from the middle of May to early July (Barbour and Davis, *Bats of America*, Univ. Press of Kentucky, 1969). The one previous record of parturition that I have found from Saskatchewan was on June 24 (Nero, "Hoary bat parturi-

tion date". *Blue Jay*, 16:130-131, 1958).

The female is thought to leave the young hanging on a twig while she forages; but Poole (*in* Barbour and Davis, 1969) shot one bat carrying two young less than a week old. We found that the two young remained on the female until July 7 when they were 12 days old. This suggests the possibility that the young may be carried by the female until they are more than a week old. Feeding by regurgitation was first observed on July 4 when the young were about nine days old. The older surviving young was eating *Tenebrio* larvae out of hand before it died.

This seems to be the longest record to date of a hoary bat's surviving in captivity. Barbour and Davis (1969) note one which was kept for two weeks and fed on dead mice, while Peterson (*The Mammals of Eastern Canada*, Oxford Univ. Press, Toronto, 1966) records a male which survived for six weeks on mealworms and other insects. The specimen reported by Nero (1958) survived for less than one week.



# A BIOLOGICAL AND CHEMICAL SURVEY OF THE QU'APPELLE LAKES

by **D. R. Cullimore**, Water Quality Research Laboratory, Regina

In Southern Saskatchewan, the climate is semi-arid with a precipitation often well below 16" per year. As a result of this, water is not plentiful and is subject to considerable losses from evaporation and leaching. The Qu'Appelle Basin forms one of the principal catchments in this area and water collects directly into the basin or is released into the system from Diefenbaker Lake. The river flows slowly east into the Assiniboine River just inside the province of Manitoba. Within this basin there are eight major lakes. Seven are on the Qu'Appelle River itself. Moving downstream, these are Buffalo Pound (source of the drinking water for Regina and Moose Jaw), Pasqua, Echo, Mission, Katepwa (the four fishing lakes), Crooked and Round Lakes. These lakes vary in depth from 5' to 45' at the middle, and in width from  $\frac{1}{2}$  to  $1\frac{1}{2}$  miles. To the north is the largest lake, Last Mountain Lake, which feeds into the Qu'Appelle River below Craven. This is a much longer lake with a much greater volume having depths up to 75' at the centre. Water entering these lakes comes from a variety of sources. These include release from Diefenbaker Lake, run-off from the land, effluent from urban sewage treatment plants, inputs from underground water systems, and direct precipitation. Each of these sources contributes not only certain volumes of water but also nutrients which encourage the growth of algae and water plants in the lakes and river systems. The Qu'Appelle lakes have long been known to support extensive algal growth. Hind in 1858, while on an expedition proceeding along the valley, observed that "an abundant growth of green confervae (algae) covered the surface" of the fishing lakes. Crooked Lake was described by Dickenson in 1857 as having water which at times was "rendered very disagreeable by the great quantity of confervae . . . now decaying

and rotting under the hot sun". It is not surprising therefore that today the Qu'Appelle lakes still possess a water quality problem caused by abundant algal growth (eutrophication). As these lakes become a greater focus of attention for recreation, irrigation and wildlife reserves, there develops a greater need to improve the quality of their waters. In 1969, the Qu'Appelle Basin Study was initiated as a federal-provincial project to evaluate water quality, hydrological and socio-economic problems connected with this basin. As a part of this study, the University of Saskatchewan, Regina Campus undertook an extensive study of the biological and chemical factors which could affect algal and water plant growth in the Qu'Appelle lakes.

## *Factors affecting Algal Growth in the Qu'Appelle lakes*

There are many different types of algae present in the lakes, but all are affected by availability of nutrients in the water. In total, there are between thirteen and eighteen chemical elements which in some form or other can control algal growth. For example, in 1970, the amount of algal growth in the lake on the Condie nature reserve was restrained by a deficiency of magnesium. However, five elements are required in large quantities to support algal growth. These are carbon, nitrogen, phosphorus, sulphur and potassium. In the Qu'Appelle system, carbon, sulphur and potassium are always abundant and the amount of algal growth tends to be controlled by the amount of nitrogen and phosphorus present in the water. Both of these nutrients enter the lakes and rivers from all the sources discussed above. Temperature also affects the amount of algal growth since different species of algae initiate growth at various temperatures. In most cases, the temperature which initiates



growth lies between 18.5°C and 22°C. Some algae will, however, grow well at lower temperatures and minor algal blooms (growth) have been found in Buffalo Pound, Pasqua and Katepwa Lakes when the water temperature has been as low as 0.5°C. In the summer period, the amount of algal growth is also partly controlled by the length of the period the lake water is above 20°C. The longer this is, the greater the algal growth. In 1972, the very cold July kept this period short and reduced the density of the algal growth significantly. Whereas it is not feasible to control the water temperature in the lakes, it may be possible to control the input of nutrients, particularly nitrogen and phosphorus. Of these two elements, nitrogen as total kjeldahl (organic) nitrogen appears to control algal growth when the concentration is above 1.4 ppm (Figure 1). Below this level, however, both nitrogen and phosphorus affect algal growth depending upon their

relative concentrations. If the quantities of nitrogen (as organic nitrogen, nitrates and ammonium ions) and phosphorus (as organic phosphorus and phosphates) entering the system could be reduced, then this could lead to a fall in the amount of algal growth in the lake. If the input is to be controlled, then the sources and their relative importance have to be identified.

Some nitrogen and phosphorus enters the water system every spring with the run-off which accompanies the thaw. The poundage of each nutrient entering the system relates directly to the volume of run-off. For nitrogen and phosphorus, the formula for calculating this is: pounds nitrogen =  $(Y - 2497) / 0.150$ ; pounds phosphate =  $(Y - 3854) / 0.206$  where Y is the run-off volume in acre feet. Thus, in areas of high run-off, the amount of nutrients entering the system will be greater. Some agricultural practices may possibly reduce this input of

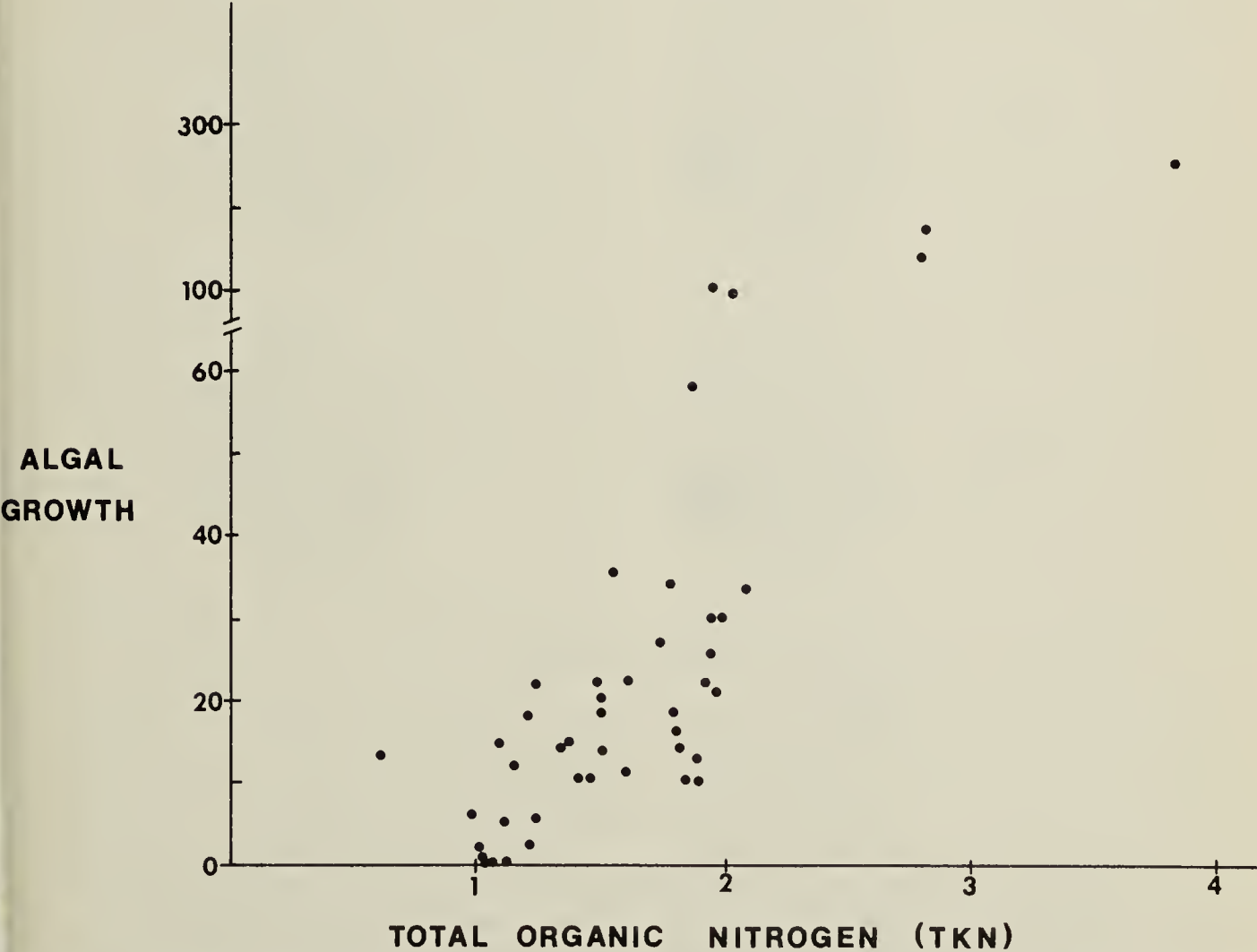


Fig. 1. The influence of organic nitrogen (TKN) on the amount of algal growth (chlorophyll) recorded in the fall of 1970.



nutrients to the water system. These include not tilling across creek beds, grassing back from creeks, not fertilising fields in the fall, and not depositing animal wastes in creeks, run-off areas, or on lake or river ice in the winter. In years when the run-off is low, the nutrients entering the system from this source is low.

Although Regina and Moose Jaw both treat the sewage by primary and secondary processes, the effluent being discharged into the Wascana and Moose Jaw Creeks is rich in phosphates and nitrogen and studies are underway by different agencies to evaluate the various procedures for removing these nutrients from the system by tertiary treatment. The percentage contribution of these effluents to the nutrient loads in the lakes is very much affected by the degree of spring run-off. In a year of high

run-off, the contribution is less than in a year of low run-off. This relationship is displayed in Figure 2. One of the major dangers is that as Regina grows in size as a result of urban drift and economic developments so the input of nutrients from these sources will continue to increase. It is predicted that Regina could reach a mean population of 192,000 by 1985 and 257,000 by 2000 A.D. with corresponding increases in nitrogen and phosphate outputs of 37% by 1985 and 83% by the year 2000. Such a population growth would substantially increase the size of the algal blooms above the levels seen today. Bioassays conducted in the laboratories here indicate that some lakes are already reaching a maximum tolerance above which major changes would occur in the floristic composition of the lake. Of their potential algal productivity,

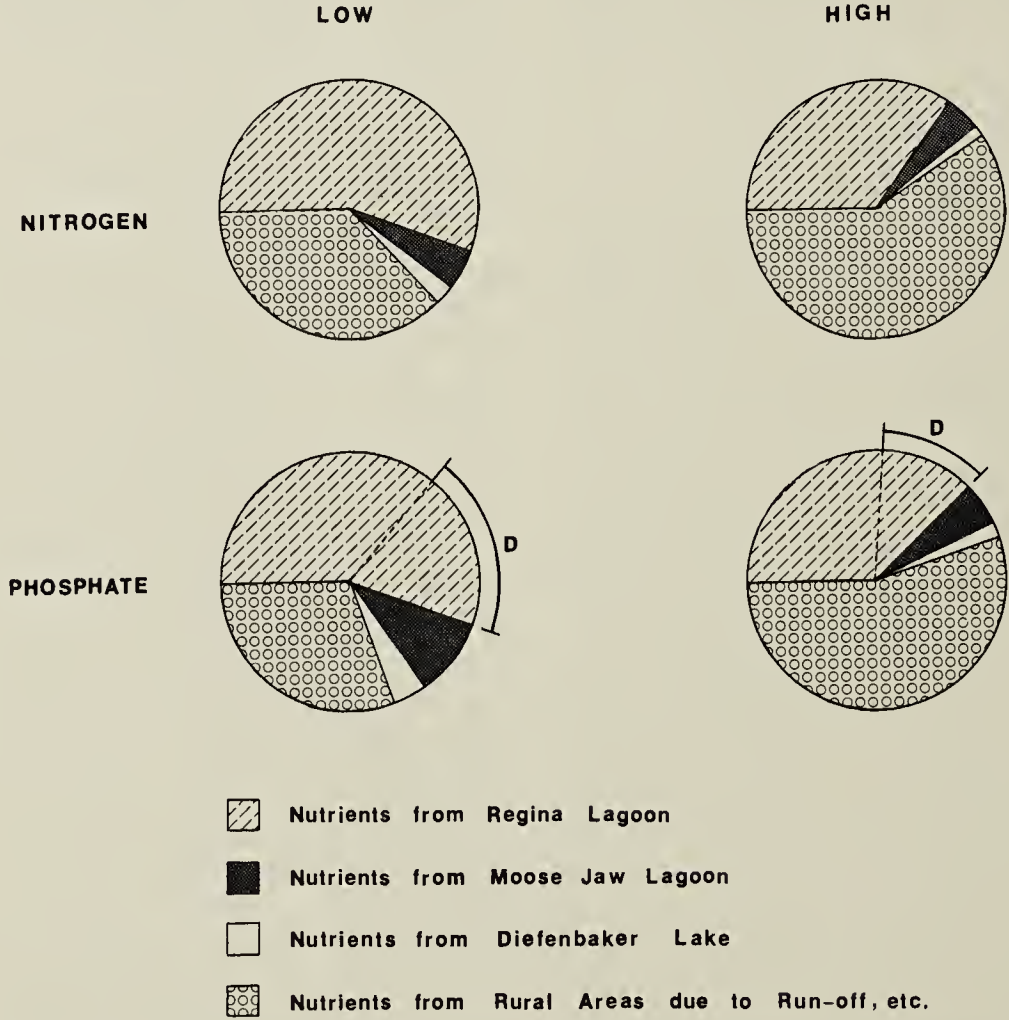


Fig. 2. Approximate breakdown of the sources of nitrogen (upper pair) and phosphates (lower pair) during a year of low run-off (left) and high run-off (right). The marked segment from Regina lagoon shown as D indicates the amount of phosphates arising from detergents.



Mission Lake was found in the fall of 1970 to be 46% of the maximum, Pasqua 33%, Last Mountain 24%, Crooked 12%, Buffalo Pound 5%, and Round 3%. Echo Lake had its highest production in the spring of 1971 with 18% of the maximum potential. These assays also showed that none of the common algae present in the lakes could grow in greater than 3 parts per million (ppm) phosphorus as phosphate but could continue to respond with up to 12 ppm of additional nitrogen as ammonium nitrate. If the algal bloom is not to get any greater than it already is, then at least the additional nutrients entering the system from the increased population size of Regina will have to be removed. If all the nutrients were to be removed and the water recycled as drinking water within the city, a marginal or significant improvement in the lakes could be expected.

Water in Diefenbaker Lake is of a much higher quality than the water in the Qu'Appelle lakes and as a result of releases into the river, improvements in the quality of Buffalo Pound Lake have already been observed together with a greatly reduced algal bloom. Some underground water also adds nutrients to the system from different sources but as yet the extent of these is still to be determined.

Some direct nutrient inputs occur in the lakes through wildlife, soil erosion, cottagers discharging waste directly into the lakes and cattle with free access to the lakes. With the exception of the wildlife, all these sources could be controlled.

The movement of nutrients through the lakes and river system is controlled partly by the rate of water flow and partly by the rate at which the nutrients are deposited into and released from the sediments. Whereas the water flow has been regularly monitored, no monitoring has yet been conducted on the sediment. Since much of the water flow occurs during the spring run-off, it is not surprising that this is also the time when nutrients move most rapidly through the lakes. The fishing lakes are a good example

of this type of movement. Pasqua Lake (the first lake in the chain) received 65% of its phosphate and 43% of its nitrogen load from treated Regina effluent during the fall of 1970. Because this continued during the winter at which time there is little water movement, the nitrogen level was raised from 1.9 to 4.1 ppm and phosphate 0.9 to 1.4 ppm in the lake from September 1970 to February 1971. Thus Pasqua Lake was acting

Table 1: Algae present in the Qu'Appelle lakes

- Euglenophyceae
  - Euglena* sp.
- Chlorophyceae
  - Actinastrum* sp.
  - \**Ankistrodesmus* sp.
  - Chlamydomonas* sp.
  - Chlorella* sp.
  - Cladophora* sp.
  - Closterium* sp.
  - Coelastrum* sp.
  - Cosmarium* sp.
  - Geminella* sp.
  - Gloeocystis* sp.
  - Golerkiria* sp.
  - Lagerheinia* sp.
  - \**Pediastrum* sp.
  - Phytoconis* sp.
  - Rhizoclonium* sp.
  - \**Scenedesmus* sp.
  - Spirogyra* sp.
  - Spongiochloris* sp.
  - Stichococcus* sp.
  - Stigeoclonium* sp.
  - Tetraedron* sp.
- Cyanophyceae
  - Anabaena* sp.
  - \**Aphanizomenon* sp.
  - Arthrospira* sp.
  - Calothrix* sp.
  - Lyngbya* sp.
  - Merismopedia* sp.
  - \**Microcystis* sp.
  - Oscillatoria* sp.
- Bacillariophyceae
  - Cymbella* sp.
  - Flagilaria* sp.
  - Gomphonema* sp.
  - Gyrosigma* sp.
  - Navicula* sp.
  - \**Nitzschia* sp.
  - Rhoicospheria* sp.

\* Frequently abundant in the lakes



as a "nutrient store" during the winter reaching very high concentrations. After the spring run-off, the nutrients which were in Pasqua Lake had been flushed down stream. These nutrients amounted to 570,000 lbs. nitrogen and 173,000 lbs. phosphate. The nitrogen was found to have moved into Mission and Katepwa Lakes whilst some phosphate increases were found in Echo and Katepwa Lakes. Thus the nutrients which moved through this period would influence the subsequent growth that could be expected to occur in Echo, Mission and Katepwa Lakes.

Typical algae found in the lakes are listed as table 1. The more common algae are indicated by an asterisk.

It becomes clear that the improvement of the water quality in the Qu'Appelle lakes is not a simple matter but involves many factors. The addition of tertiary treatment facilities to the sewage treatment plants of Regina, Moose Jaw and the other towns would do much to reduce nutrient input. Control of run-off, improved practices by cottagers and farmers (including feedlot operators) would also have an effect. However, the actual effect that all of these practices will have on the size and extent of the algal blooms cannot as yet be determined. This must await the development of satisfactory models by which all of these factors can be weighted so that their effect alone or in combination on algal growth can be determined.

#### *Factors affecting Water Plant Abundance in the Qu'Appelle lakes*

Eight species of water plants are frequently found in the Qu'Appelle lakes. These include lesser duckweed (*Lemna minor*), coontail (*Ceratophyllum demersum*), spiked water milfoil (*Myriophyllum exalbenscens*), sago pondweed (*Potamogeton pectinatus*), Richardson's pondweed (*Potamogeton vaginatus*), three square rush (*Scirpus americanus*), and the common great bulrush (*Scirpus validus*). Some differences were noted in the percentage abundance of these various plants from lake to lake during a survey

conducted in July 1971. In Last Mountain and Buffalo Pound Lakes, Richardson's pondweed was most abundant whilst in the remaining lakes, sago pondweed was generally dominant. One exception was in Echo Lake where there was an abundance of spiked water milfoil. In some lakes, coontail was also found to be abundant along with Richardson's pondweed. Attempts were made to correlate the presence of these plants to other measured factors to determine which factors, if any, affected the relative dominance of the different species. A clear correlation was found between the levels of total phosphate in ppm in the water and the composition of the weed flora. At phosphate levels below 0.2 ppm Richardson's pondweed and coontail were equally abundant. As the concentration rose to 0.5 ppm, coontail disappeared from the flora and was replaced by sago pondweed as the co-dominant plant. In water with phosphate values between 0.5 and 1.0 ppm phosphate, the sago pondweed became more dominant until above 1.0 ppm phosphate when this species was completely dominant except in Echo Lake where high phosphate values were accompanied by high nitrate values and here spiked water milfoil was the most abundant.

From this data, it would appear that the composition of water plants in the lakes does reflect the levels of phosphate in the water and that a local variation may reflect an input of additional phosphate or a dilution effect caused by a spring which releases low phosphate water into the lake.

#### *Conclusions*

The Qu'Appelle lakes are some of the most eutrophic lakes in North America and any attempt to improve the water quality of this system is going to involve considerable expenditures which must be made in the correct areas. In the meantime, there are a number of steps which individuals can take to reduce the level of nutrients entering the lakes. Cottagers should stop discharging any liquid or solid waste into the lakes. Farmers



should prevent cattle from entering the lakes, stop cultivating across creek beds, stop placing animal wastes in areas where the spring thaw will cause the material to enter the water system, and resist the temptation to apply fertiliser in the fall in areas where high run-off is likely to occur.

#### ACKNOWLEDGMENTS

The author would like to express sincere gratitude to the Qu'Appelle Basin Study Board and the Saskatchewan Research Council for financial

support of this work; to members of the Qu'Appelle Study Board for the data relating to nutrient load and run-off which had been reported by other agencies; and to others who aided in many aspects of this study.

*Note:* At the time of going to press, the Qu'Appelle Basin Study Public Report was in the hands of the printers and was expected to be released before this article. Persons wishing to learn more of this study are urged to read this report which should be available through libraries.

## The Blue Jay Bookshelf

**FLORA OF THE PRAIRIE PROVINCES, PART III, Connatae.** 1972. By Bernard Boivin. 224 pp. Issued as *Provancheria* #4, being *Memoirs of the Louis-Marie Herbarium, Faculty of Agriculture, Laval University, Quebec City*. Reprinted from *Phytologia* 22: 315-398 (1972) and 23:1-140 (1972). Available from the Blue Jay Bookshop, Box 1121, Regina, as are the preceding two parts.

This is the third of the four-part series on the flora of the three prairie provinces upon which Dr. Boivin has been working since 1949 at least. Part I was reviewed in this magazine, June, 1968; part II, September, 1969.

In Boivin's treatment of the subject, "Connatae" includes the bulk of what used to be called "Gamopetalous" or "Sympetalous Dicotyledons" those families of dicots in which the often showy corolla is built up of petals fused into one sheet of tissue. Among these, Ericaceae (Heath Family), being woody, was, along with its relatives, treated in Part I; Caprifoliaceae (Honeysuckles) was also included in Part I for the same reason; Primulaceae (Primrose Family) appeared in Part II among the polypetalous dicots. However, here in Part III we find the well-known families Solanaceae (Potato Family), Scrophulariaceae (Snapdragon Family), Polemoniaceae (Phloxes), Boraginaceae (Blue Bur

Family), Labiatae (Mints), and Gentianaceae (Gentians), besides assorted smaller families. The mighty family Compositae (Sunflower Family) appears after these others and takes up over half the book. Because of the presence of Compositae in this part, a more than usual proportion of large, difficult, and controversial genera in which the species are often not clearly defined come up for treatment. These include *Solidago*, *Aster*, *Erigeron*, *Antennaria*, *Senecio*, *Arnica*, *Helianthus*, and *Artemisia*. On this matter Dr. Boivin has stated his strategy in the discussion of *Aster simplex* on pages 119-121.

The trouble with writing a book review is that one must pass over the 999 items out of 1000 which offer no scope for objections, for these items have been treated according to the highest standards of excellence; but one is obligated to pick out the one defect per thousand items. So it is with this review. Part III extends the work of its predecessor parts in giving us a complete, concise, and up-to-date flora of the Prairie Provinces, than which nothing more favourable need be said. But I noted a couple of errors, along with several items which will be found unusual by users of previous floras.

As for the errors: 1) There appears to be something seriously muddled in the primary key to the families of



Connatae, pages 1-3. Plants with an irregular spurred flower are referred to Group C in the preliminary parting into groups, but in the detailed key these plants are treated as Group D, Group C proving to be only a subdivision of Group B. Also, in that leg of the preliminary key dealing with plants with irregular unspurred flowers, those plants with opposite leaves are assigned to group D in the preliminary key but appear as Group F in the detailed key. Among the plants with irregular unspurred flowers, those with verticillate or wholly basal leaves seem to have been transferred from the opposite-leaved to the alternate-leaved groups between the preliminary and the detailed keys. This will need to be revised in future editions.

2) For the following species: *Hedeoma hispidum*, p. 68, *Plantago patagonica* (*P. purshii*), p. 80; *Hymenoxys richardsonii*, pp. 163-164; and *Artemisia longifolia*, p. 174, the habitat in whole or part is given as wind-eroded steppes or badlands. However, in temperate climates getting over two inches of rain a year, and on all soils other than sand, water completely predominates over wind as an agent of erosion. Even on sandy soil, disturbance, as by herds of bison or cattle, or by ill-advised farming, is necessary to get anything noteworthy in the line of wind erosion in Western Canada. The hoodoos (erosion islands) of blowouts on sandy farmland in the 1930's bear a deceptive likeness to the hoodoos developed in the till along the South Saskatchewan River at Medicine Hat, or to larger scale badland erosion islands like Castle Butte in the Big Muddy, but the latter two instances have been carved by running water. The four species mentioned grow on eroded habitats, but these are water-eroded habitats no matter how physiologically dry the hill slopes. This may be understood most clearly for the last two species mentioned, for they grow on dry or eroded clay soils, *Hymenoxys richardsonii* mainly on till and *Artemisia longifolia* obligately on bed-rock shales or clays.

Among items which may be found unconventional in *Flora of the Prairie Provinces, Part III*, are the lumping of *Lappula echinata* and *L. occidentalis*; the transfer of *Aster ptarmicoides* to *Solidago*; and the transfer of *Haplopappus nuttallii* to *Machaeranthera* as *M. grindelioides* (Nutt.) Shinners. This last transfer seems unnatural to this reviewer, unless there be a series of connecting intermediate species south of us in the States.

We await the appearance of Part IV, Monopsida (Monocots) with interest; it will complete the work.—  
*John H. Hudson, Saskatoon.*

**COMMON COULEE PLANTS OF SOUTHERN ALBERTA. 1972.** By Job Kuijt. University of Lethbridge Production Services. xi plus 124 pp. \$1.50. (Available from University Bookstore, Lethbridge).

"Long ignored by many as sterile and barren waste-lands, undisturbed coulees are places of great and subtle beauty. Yet, it has remained very difficult for the naturalist to identify the many colorful and unusual kinds of plants which grace the coulee slopes. This little book is written for such people." (Introduction, page v).

The amateur botanist will appreciate *Common Coulee Plants of Southern Alberta* for a number of reasons. Although there is no key to identify the plants, the author has divided the book into four sections based on the color of the flowers. For each plant he has provided an accurate line drawing; a visual method to determine the size of the plant; the general habitat; the flowering time; and in some cases the main differences between one plant and other similar species with which that plant may be easily confused. He also includes a numerical guide to flowering times which is helpful in identification of a species, for it aids the viewer to eliminate those species which flower at other times of the year.

This book does not list every species found in a coulee but, as the title suggests, the author is dealing only with common species. He has omitted those



species which he considers natural "interlopers," species from forests, and flora associated with permanent rivers such as poplars, willows, dogwood, birches, horsetails, etc. He has also excluded introduced weeds.

The studies on which *Common Coulee Plants of Southern Alberta* was based were conducted in a triangle of southern Alberta formed by three areas: Dinosaur Provincial Park, Lethbridge, and Writing-on-Stone Provincial Park, but the book probably applies equally well to all coulees in southern Alberta and southern Saskatchewan.

This book will be extremely useful to beginning botanists. Those who desire more detailed scientific information will, as the author himself states, use the more technical books which are already available. It is unlikely that the binding on the book will stand up to rugged usage in the field; on the other hand, the price is very reasonable.—Gwen J. Jones, Regina.

**EFFECTS OF PHOSPHAMIDON ON FOREST BIRDS IN NEW BRUNSWICK. 1972.** By C. David Fowle. Canadian Wildlife Service Report Series No. 16. Information Canada, Ottawa. Catalogue No. CW 65-8/16. 25 pp. \$1.00.

Phosphamidon is an organophosphate compound and as such it is being scrutinized extensively as a substitute for DDT in insect control. The results cited in this report indicate drastic effects on birds above application rates (from aircraft) of greater than 0.25 per acre. Effectiveness of control of the target organism (the spruce budworm) at this level is not noted. The anticholinesterase activity and its nervous and physiological consequences of dimethyl phosphate esters is the basis of their hazard for animals; and birds and man are by means excepted from their impact. It is the opinion of the reviewer that information of the type in this report should be published in an appropriate scientific journal, or at least submitted for publication at the

same time as it appears in a report of this sort. However, the Canadian Wildlife Service is to be commended for making their research findings available to a larger group of readers in this form.

The experiments described in the report were initiated after the author observed that a number of forest birds were killed or disabled in earlier spruce budworm control with phosphamidon at the rate of 0.45 lb. per acre. A tract of 161,000 acres was sprayed in the earlier experiment and the number and range of species noted as killed or disabled in this report suggests that a fantastic kill of forest birds took place. Insectivorous birds were the most common victims, but species of diverse feeding habits (robins, kinglets, sparrows, grosbeaks, thrushes, warblers, juncos, wood peewees, sapsuckers, ruffed grouse, blue jays, purple finches, nuthatches) were affected. Reference is made to an earlier series of experiments which demonstrated that birds which move actively about on sprayed branches may pick up a lethal dose of phosphamidon by absorption through their feet. (Not all biologists believe that this is possible.)

An economic resource such as timber is worthy of careful management and protection from disease and insect damage. Still, the effects on bird populations here reported raise some concern about the adequacy of testing of phosphamidon before its use, and about the ecological soundness of its use *at all* if one of the consequences is this level of destruction of forest birds. As Lee M. Talbot (*Bioscience*, March 15, 1970, p. 331) has noted and many others have echoed in recent years: "We still know so little about the ecology of the earth that we are not yet in a position to define the role of most living species and therefore to evaluate their significance to our own life support system."

The study described in the report may still be considered only a beginning in the evaluation of the effects of phosphamidon on vertebrates. The nature of the study points to the need



for further independent investigation before initiation of use of organophosphates; and there should be an independent monitoring of effects of the chemical during use. Notably absent in this report are post mortem findings and description of the actual physiological effects of phosphamidon. More replication of plots on each treatment and suitable statistical tests of significance would improve the support of the following conclusions:

"1. Operational aerial spraying of phosphamidon at emission rates of 0.375 - 0.5 lb. per acre may result in substantial mortality of forest birds. Lower doses of about 0.25 lb. per acre may occasionally cause losses. Sprays with a high proportion of fine evenly dispersed droplets may do more damage than those with fewer fine droplets.

"2. Birds can pick up lethal or debilitating doses from sprayed vegetation through their feet.

"3. Birds may be poisoned by eating sprayed food soon after spraying. Doses of 1 to 3 mg/kg of active ingredient are sufficient to kill common forest birds."

On the whole, the report suggests that phosphamidon may seriously affect forest birds. Another organophosphate, lannate, has been used extensively in Saskatchewan and I suggest that its effects on non-target organisms should be carefully scrutinized.—*J. R. Jowsey, Regina.*

**ISLAND YEAR. 1971.** By Hazel Heckman. Drawings by Laurie Olin. University of Washington Press, Seattle and London. 255 pp. \$7.95 U.S.A.

In *Island Year* Hazel Heckman has recorded her observations of the flora and fauna seen on Anderson Island, off the coast of Washington, during a period of twenty years of wandering over the trails. Though a list of plant names and bird names is given, the author states that the book is not intended to be a field guide to the flora and fauna of the island. She explains, rather, that she explores for pleasure



Drawing by Laurie Olin

and identifies solely to satisfy her own curiosity.

Through each month of the year she takes the reader on walks along trails on the island, and the reader sees through her eyes the joys of nature. Her feeling of yearly anticipation is recorded when she says, "Each afternoon in February I went in search of spring—the stir of new life beginning."

Hazel Heckman delights in figurative descriptions: "crisp white bracts of Pacific dogwood like fresh, starched doilies appeared overnight"; "Deer browse in tall grass, unseen, or rest in the sun in flattened round rooms with hay walls." Much use is made, too, of alliteration: "A two-point buck deer lifted his head, gave me a curious look from his limpid, long-lashed eyes and went back to his browse." Such sentences make the book pleasant reading.

The drawings, of varying quality, serve to break the text at suitable points and aid in giving *Island Year* an attractive format.

The book closes on a sad note. Trails the Islanders have wandered and enjoyed for years are now being exposed to the bulldozer: "A network of wide-slashed roads that go nowhere . . . shorelines cleared of wild iris and cat tails for swimming and boat launching . . . mile upon mile of parking strips . . . The wilderness erodes." One echoes the words of Hazel Heckman when she concludes *Island Year* with the statement: "We can not shrug this off as progress."—*Connie Pratt, Regina.*



**BUFFLEHEADS. 1971.** By Anthony J. Erskine. Canadian Wildlife Service Monograph Series No. 4, Information Canada, Ottawa. 240 pp. \$7.50.

The relative scarcity of information on Buffleheads in the abundant literature on waterfowl is well illustrated in the Reference Section of this interesting and well-written book; only 19 of the 210 titles listed specifically mention Buffleheads. The diversity of the listed titles also underscores the value of the book as a compendium of available knowledge on Buffleheads. In addition, the book contains much original and previously unpublished data.

The first two chapters dealing with behaviour of Buffleheads mainly summarize the work of other authors, although Erskine adds some original data on group sizes and chronology of pair formation in Buffleheads.

The chapters on biology of Buffleheads on the breeding grounds deal mainly with the studies of Erskine and Sugden in British Columbia during the summers of 1958-62. An amazing amount of new information is presented on this relatively uncommon species but the data interpretations are unfortunately hampered by the absence of marked birds in the studied populations.

The section on fall migration is mainly a thorough and detailed analysis of banding records. In my opinion, scientific etiquette should require acknowledgment of banders when bird recovery data are used, even though permission to use the data has been granted. This is apparently a minority view because banders are not acknowledged in many recent papers dealing with bird band recoveries.

The portions of the book which deal with harvest distribution and populations are excellent assimilations of information from diverse and often obscure sources. They rely heavily on information from the U.S. Department of the Interior Waterfowl Status Reports for which, unfortunately, editors and authors are not cited.

In the introduction, Erskine asserts that he was "... intrigued to learn

what factors set limits to its [the Bufflehead] distribution and abundance." These factors are thoroughly discussed in Chapter Eight. It is not surprising that no firm conclusions are presented because, as Erskine admits, "there are many easier birds to study than buffleheads."

The thorough and comprehensive text of the book is well complemented by the excellent figures and tables which are uniformly clear and concise. Those data not especially pertinent to the text are relegated to appendices.

Most ornithologists, biologists and naturalists will want to add this well-written book to their collections, and its price should present no obstacle. Serious bird-watchers especially interested in waterfowl will find a wealth of information on one of our lesser-known waterfowl species in this publication.—*D. H. Rusch, Winnipeg.*

**LEARNING ABOUT ENVIRONMENT. 1972.** An ecology unit for students at the intermediate and senior levels of the elementary school program. \$1.50. Accompanying teachers manual. \$1.50. By Robert F. Harrington and Richard C. Passmore. Published for Canadian Wildlife Federation by Carlton-Green Publishing Company Ltd., Ottawa.

Environmental quality has been a matter of increasing concern during the past decade, and a great deal of information has been presented in the various public media. Words and terms once the exclusive possession of the "expert" now slide easily off the tongue of the general public. However, knowing the jargon does not necessarily imply a knowledge of the basic principles. In a number of cases well-meaning enthusiasts have seriously harmed the cause of environmental stability by overstating their case, or by offering "instant solutions" to problems which were seen in the wisdom of hindsight to require much deeper study.

The authors are well aware of such dangers, and carefully and attractively build up a background of basic facts



and attitudes, on which the student may expand his awareness. The examples in the study unit and its accompanying guide are relevant and well-researched. The intricacies of relationships are well-portrayed. Even more commendably, the dilemma of the dedicated ecologist is sympathetically explored. The importance of reserving judgment until at least the major interrelationships have been clarified is emphasized. This is a particularly valuable concept to develop in the upper elementary grades, where there is a tendency to assume that there is a "false" and a "correct" answer to any given problem. Is there in fact such a thing as a "bad" animal and a "good" animal? Are things always what they seem to be?

One section I found of particular interest was the development of the concept of stability through diversity. Children born in the mechanized farm economy of today accept the sight of mile after mile of wheat as something altogether natural and unchangeable. The concept that such a monoculture is not natural and presents some very serious threats to ecological stability comes as something of a shock to them. We are all prone to think of ecological mismanagement as something "the other fellow" does and something for which "the other fellow" is responsible. As long as species extinction and pollution are things which concern some other society, so long will the ecological message fall on deaf or indifferent ears. The thoroughly Canadian content of text and illustrations produces this sense of relevance. The presentation is suitable for upper elementary grades and should also be quite applicable to secondary school courses.

The avowed intent of the production is to provide a teachable block of material which will provide students with an understanding of their environment and their own role in it. In this it appears to succeed. Unnecessary complexities are avoided, but there is little tendency to oversimplify. There is no doom-crying, but a reasoned and appealing call to concern

and action. In the words of Francis Bacon, "He who would command nature must first learn to obey her." Man has broken little rules for many years and now some of the big rules are beginning to catch up with him. The thoughtful student will gain from this unit a clearer grasp of the rules by which he must play for the rest of his life.—*W. A. Quick, Regina.*

**EFFECTS OF DEER AND DOMESTIC LIVESTOCK ON ASPEN REGENERATION IN UTAH. 1972.** By Arthur D. Smith, Paul A. Lucas, Calvin O. Baker and George W. Scotter. Publication No. 72-1. Utah Division of Wildlife Resources. Illus. 32 pp.

The stated objective of the project described in this study was to test the belief that big-game animals prevent regeneration of aspen in Utah. Studies were conducted on four sites with clear-cutting, partial cutting, soil scarification, and girdling of the aspen. Fences were employed at two sites in an attempt to determine effects of grazing by deer alone, sheep and cattle, deer and cattle, and deer plus sheep.

With all of these parameters to confuse the results it is only the determined researcher or dedicated amateur who will attempt to read this publication to its end.

Experienced farmers or ranchers would concur with the findings that sheep are more damaging to plants than cattle. (Their dentition is more efficient in this respect.) Soils and climatic data are almost overlooked; breccia and conglomerates seem to provide harsh conditions. Game populations were apparently so light as to make comparisons with domestic animals meaningless.

The sincerity of the authors seems unquestionable as they have tried to interpret their data with bar charts and tables. One regrets, however, that the paper does not include more than three of their good quality photographs.—*Thomas R. Smith, Saskatoon.*



## COYOTE MANAGEMENT

Many of Saskatchewan's municipalities are currently considering the question of whether or not to participate this winter in the Department of Natural Resources' coyote baiting program. Being concerned that municipal councils might hear only about damage that coyotes might cause and hoping that the article "Coyote management in Saskatchewan: Is poison the answer?" would provide another viewpoint for consideration, I sent copies of the September 1972 *Blue Jay* to the municipalities and local improvement districts which used bait last year, at the same time asking for information about the local coyote situation. This amounted to 58 R.M.'s and L.I.D.'s (out of a total of just over 300) with an average of 5 baits in each. Two stations were set by DNR in Moose Mountain Provincial Park. In addition, about 100 baits were set by the South Saskatchewan Wool Growers' Association in about 16 R.M.'s and L.I.D.'s. I consider this a minimum list, since one regional superintendent stated in a letter that in addition to the stations in the R.M.'s listed, "some baits were placed on request by land owners who had specific problems with coyotes, e.g. sheep ranchers, poultry raisers, etc."

I have received several letters from secretary-treasurers of the R.M.'s which are of interest. Two councils do not agree to participation in the poison program but the Saskatchewan Department of Agriculture independently places three bait stations in both municipalities, in government sheep pastures. The consensus of the coyote situation so far is that although calves may be somewhat vulnerable, sheep ranchers are the only ones who encounter significant financial losses to coyotes.

A most informative letter was sent by a turkey farmer of the Wynyard area. He contends that turkey losses are strictly a management factor because coyotes will not go inside a proper fence but will take those allowed to stray over the fence. He

described a situation (which occurred a number of years ago) in which more than a dozen coyotes frequented a disposal pit for entrails etc. and yet he had no trouble from them. When this food supply was removed by the filling in of the pit, the coyotes moved on rather than turning to the turkeys for food. The more recent marked reduction in coyote numbers he attributes to the activities of the owners of motor toboggans — one local operator is credited with getting 50 or more coyotes. Last year this farmer experienced fox trouble for the first time. This was a factor in his decision to close down one farm, and because of a loss this year of 450 turkeys (at \$3-\$7 apiece) a second farm is being abandoned. Here seems to be an example of the value (in this case financial) of the coyote as a balance to the fox population.

This farmer notes further that a coyote kill of a turkey is distinctive. Is this true also, I wonder, for calves and lambs? I would appreciate hearing of other readers' experiences.

In response to the *Blue Jay* article, a letter from the Minister of Natural Resources, Hon. Ted Bowerman, expresses concern about 1080 poison as well as the need to consider agricultural interests. Although he agrees that changes have occurred since the poison program was initiated and review is both needed and planned, he is awaiting the outcome of the study by the ecologists in his department — no date was given.

Perhaps it is too much to hope that poisoning can be replaced by trapping and/or financial compensation in the near future or even that poisoning can be limited to sheep farmers. But surely it is not too rash to restrict the use of poison to cases of proven coyote damage. I hope that all rural readers will request this of their municipal councils. — *Nora M. Stewart, Craven.*

**Editor's Note:** "Perspective on wolf control in Quebec" the first special publication of The Canadian Nature Federation, 46 Elgin Street, Ottawa, price one dollar, reviews the history of wolf and coyote control in Quebec and states that the CNF "is unequivocally opposed to the use of poisons against wildlife."



# PLEAS FOR PROTECTION OF AIYANSH LAVA FLOW

by **T. Gentles**, 41 Langley, Regina

Just north of Terrace, British Columbia, lies a unique and fascinating geological phenomenon. Only 200 years ago, according to Indian legend, lava erupted from a fissure in a tributary of the Tseax River. The lava flowed down the tributary for three miles, along the Tseax River for 11 miles and then spread over the floor of the Nass River valley to form a plain six miles long and three miles wide. The lava flow formed two lakes, one in the tributary and the other in the Tseax River; now called Lava Lake, this latter expanse is seven miles long and 180 feet deep. At the source of the lava eruption, volcanic cones were created; the largest, 950 feet across and 300 feet high, has a crater in the top which is 250 feet across and 100 feet deep.

In August, 1972, I had the opportunity to visit this remarkable area. One leaves the main highway at Terrace to follow a logging road north, open to private vehicles only during the evening and at night, for logging trucks pre-empt the entire width of

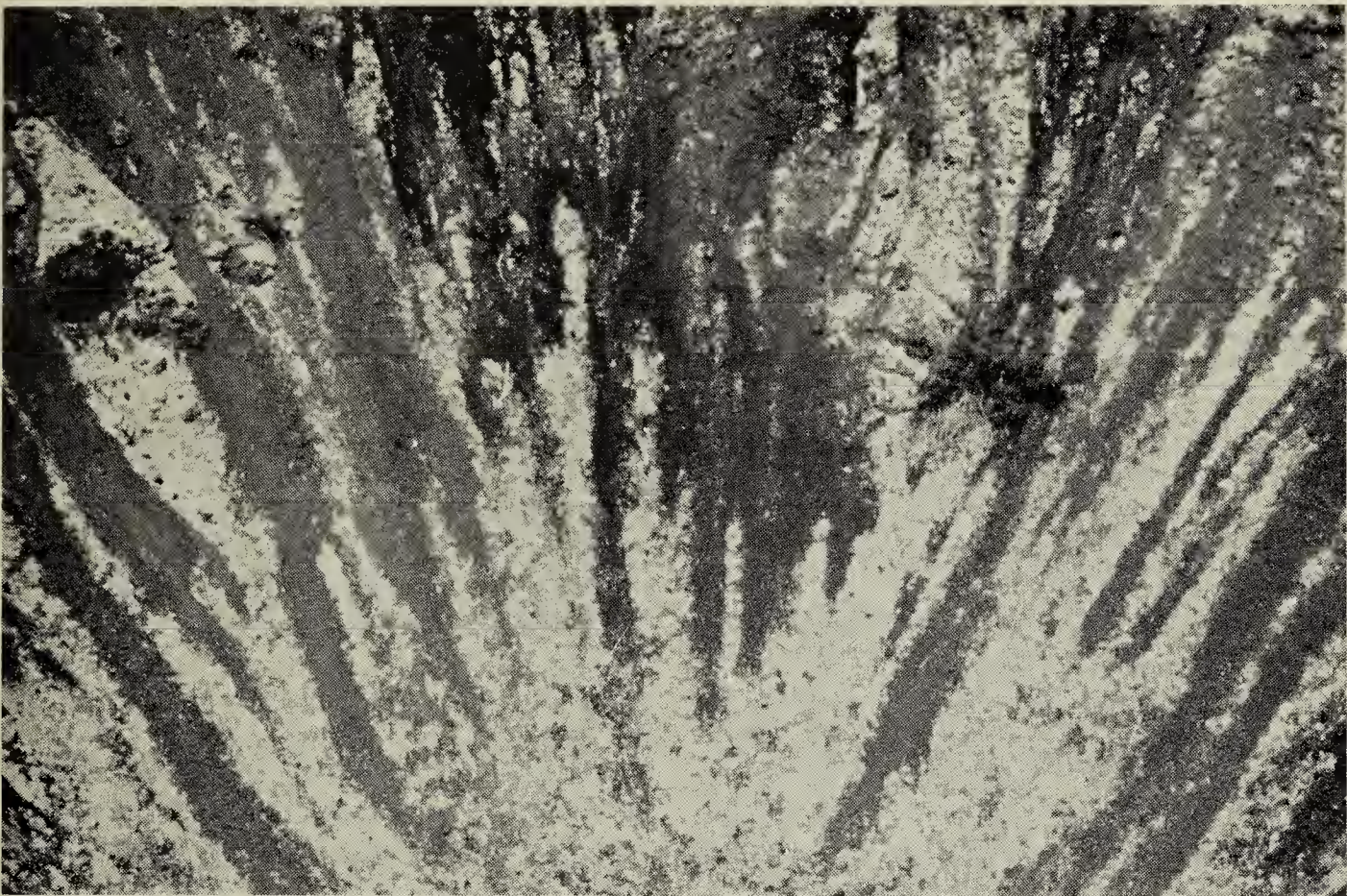
the road during the day. There is a small camp ground at the north end of Lava Lake at the point where the lava came down the tributary and dammed the Tseax River. The three-mile walk up the tributary to the volcanic cones is a rare experience, for this is the only part of the flow still undisturbed. The surface of the lava flow is composed of broken fragments and blocks of solidified lava. The whole mass must have been slowly carried down the valley on the surface of the flowing molten lava. The constant grinding and crushing has broken the surface into blocks measuring from a few inches to 10 feet in diameter. In places it appears the surface has congealed and then slumped into a cavity as the lava flowed away from underneath; in other cases it appears the lava has erupted onto the surface for short distances.

The cinder cones are interesting in themselves, composed as they are of scoria and "bombs" of lava (fragments of congealed lava which have been ejected from the fissure). The gases



The undisturbed three miles of the Aiyansh lava flow





Looking down into a Aiyansh lava cone



Aiyansh lava in the form of large blocks

have expanded, with the result that the fragments are much like pumice. The walls of the cones and the crater on the inside appear to be at the angle

of repose of the material which is approximately 40° to the vertical.

It is quite obvious that this area holds much of interest for the geolo-



gist: where else in Canada can one see an example of volcanism so young and so extensive? Volcanic cones and a 20-mile lava flow are text book examples of the geological forces that have shaped a good deal of the earth's surface.

The three-mile area of lava flow mentioned above has such a continuous growth of mosses and lichens that it appears to be carpeted in fur; in only a few places are the grasses and smaller shrubs securing a foothold. There are two disappearing streams in the tributary, and streams from the mountainside have carried mud and debris to the surface of the lava flow. This has sealed openings in the lava and enabled limited stands of beautiful trees to become established. The growth of such lush vegetation is limited since the lava is not completely sealed, and the streams get visibly smaller in a few hundred feet and disappear in the bottom of the flow. But one can imagine how interesting the plant communities that have developed on the lava in 200 years will be to those involved in the study of plant succession and ecology: a veritable outdoor laboratory!

As I have mentioned, the area is accessible. Unfortunately, its accessi-

bility has created a problem: forestry operations have already resulted in the destruction of much of the flow. Masses of stumps and débris have been pushed downhill onto the surface, roads and trails have been built, often for no apparent reason. (The terrain is ideal for road building as the lava is fragile and easily crushed to form a road bed.) Borrow pits are taken at random in the lava flow and the material is hauled onto the forest roads for miles around.

A check with the Forestry Department indicates that there is as yet no protection for the last undisturbed three miles of this remarkable area; in fact, on the maps the area right next to the volcanic cones is shown as the next one to be logged!

As far back as 1918, Rev. J. B. McCullagh, C.M.S., warned of the danger of extinction of the area, "... Supposing the government have not the imagination to turn [it] into a national park . . ." (Ignis private press, B.C. Archives). Hopefully in this time of awareness of the fragility of such natural phenomena, the British Columbia and Canadian governments may be prevailed upon to preserve and protect such an interesting and valuable area.



Aiyansh lava flow is being used as a garbage dump and as road building material



# Letters and Notes

## DRAINAGE OF WETLANDS

Last winter the provincial government advised the SNHS that a Wetlands Project Advisory Committee was being formed which would consist of four representatives of agricultural interests and four from wildlife organizations and invited it to name a representative. The Committee considers proposals about which there are conflicts of interest, and advises the Wetlands Project Committee which consists of the deputy ministers of Natural Resources, Environment and Agriculture. In turn, the latter group make recommendations to the government.

The wetlands projects so far to come before the Committee are schemes to completely or partially drain sloughs, marshes and lakes for agricultural purposes. Seventy-five per cent of the work is paid for out of ARDA (federal) funds, and 25 per cent by the local ratepayers. Over 100 projects have been mentioned, but only those involving conflict of interest come to the Committee. So far 14 projects have been considered in five meetings, two of which involved public hearings. One drainage project was recommended not to go ahead, one to receive further study, and the other 12 to proceed (six of these on somewhat reduced scale).

Three schemes involve the draining of only one body of water. Others, however, are quite large: one has 157 miles of drainage and lateral ditches; another drains an area encompassing over 100 potholes.

To farmers able to place more land into production and to operate more efficiently there can be a financial gain from the drainage of wetlands. That other farmers have reservations for a variety of reasons is also evident.

A number of features about the program are of concern to me. That one federal program is paying to drain potholes while another is paying to preserve wetlands seems patently inconsistent. The information provided

to the Committee about the wildlife and other natural values has been meagre. There has been no input regarding environmental factors. As there are many proposed projects (some involving several townships), questions about the total, mass effects of drainage are of considerable concern. What will be the effect on downstream flooding in the spring? What will be the effect, if any, on ground water levels? What, if any, will be the effect on micro-climates? What will the resultant countryside be like? Why are ARDA funds being used in a quite different way in Saskatchewan than in Ontario? Should there not be overall guidelines to achieve a balance? These questions were asked but no sound answers were received.

These reservations were pointed out to Mr. G. R. Bowerman, Minister of Natural Resources, in a recent meeting with him. A moratorium on further drainage projects was recommended while the broad implications are determined and policy recognizing all factors is established.—*J. A. Wedgwood*, Saskatoon.

## Annual Report on the Indian Head Bluebird Trail

(Continued from page 227)

were raised in the successful nests. Seventy-five adult female Mountain Bluebirds were caught on nests and banded. Also 18 females that had been banded in previous years were caught again this year. Some of these females were banded three years ago in 1969. Three of the females recaptured this year were banded as young birds in the houses in earlier years. A total of 625 young Mountain Bluebirds were banded this season.

Tree Swallows occupied over 500 houses and raised well over 2,000 young. Two hundred adult female Tree Swallows were caught while incubating their eggs and banded. An additional 50 adult females were captured already wearing bands put on



them during the three previous years. Nine of these females were banded as young birds in the houses and the remaining 41 were banded as adults.

Since I began making bird houses in 1963, there has been a grand total of about 800 Mountain Bluebird nests producing over 3,000 young, and some 1,800 Tree Swallow nests producing over 8,000 young.—*Lorne Scott*, Indian Head, Saskatchewan.

### **A REPORT ON THE BROADVIEW BLUEBIRD TRAIL**

An additional 75 nest boxes were set out last fall, increasing the number of houses on our trail to 175. This bluebird trail project was started in 1969.

Mountain Bluebirds occupied 32 of the 75 new houses, and Tree Swallows also nested in 32 of the new houses. About 370 young Mountain Bluebirds were raised from approximately 74 nests last spring. This is an increase of about 54 nests over last year. Tree Swallows occupied about 68 nest boxes, an increase of nine nests over last year. Some 367 young were fledged.

The houses are situated south of Broadview, forming a triangle with boundaries of the area extending from two miles west of Broadview, east to Percival, and 10 miles south of Broadview.—*David Chaskavich* and *Don Weidl*, Broadview, Saskatchewan.

### **HOUSE WREN AND TREE SWALLOW**

On June 11, when checking bird house No. 27, which was being used by Tree Swallows, I was very surprised to find three House Wren eggs in the nest with five Tree Swallow eggs.

On June 22, I again checked the nest, and found the three House Wren eggs on top of the five Tree Swallow eggs.

On July 2, the nest contained one young House Wren and five young Tree Swallows.

On July 12, the young Wren was flying around, accompanied by both

adult Tree Swallows. The five young Tree Swallows were still in the nest.

When the nest was vacant, I cleaned the box, and examined the contents. The lower section of the nest had been built by House Sparrows, and contained a dead adult Tree Swallow. Over this the Wrens had built their nest of twigs. The Tree Swallows then took over and added more feathers.

The House Wren and the Tree Swallow must have laid their eggs when the other was out of the nest. I did not see the adult Wrens.

I have to report that no bluebirds used the houses again this year.—*John L. Murray*, Lyleton, Manitoba.

### **BIRD BOXES HELPED BLUEBIRD SPREAD TOWARD THE EAST**

The Mountain Bluebird, once a western Canadian species, has been gradually extending its range eastward over the past number of years. This range expansion has no doubt been helped along by the efforts of clubs and individuals in setting out nest boxes.

The Birds Hill Park Bluebird Lane, which has put up a sizeable number of boxes in various parts of Manitoba, had two pairs of Mountain Bluebirds nesting on the east side of Birds Hill Provincial Park last summer. One pair nested at the junction of roads No. 206 and No. 212 in box No. L-16 and the other pair nested half a mile north of that in box No. L-26.

The first pair of Mountain Bluebirds were spotted on April 14 by me while I was inspecting some boxes two miles south of the junction of highway No. 44 and road No. 206. On April 21, the same pair (presumably) were seen inspecting some more boxes at the junction of roads No. 206 and No. 212. This time they were seen by George Grzybowski as well as myself. On April 28, I found a nest belonging to this pair in box No. L-16. At that time no eggs had been laid. On May 5, one egg was present and on May 12, six had been laid. This was unchanged on May 20 when my brother Eric saw the



pair. Unfortunately, the box was not inspected again until June 4, when Herb Copland, Eric and I found the nest empty. The adults were not seen again.

On April 28, the second pair of Mountain Bluebirds were spotted by me half a mile north of box No. L-16. On May 5, I found the nest in box No. L-26, but with no eggs. On May 12, three eggs were present. This nest was found destroyed on May 20 by Eric. These adults, too, were not seen again.

Dr. John Lane of Brandon, upon reviewing the data mentioned, claims that the nest in box No. L-16 was vandalized. "The date of the final egg was May 10. Add 14 to 15 days incubation till hatching date, May 24-25. Then add 17-18 days till the young vacated the nest, would make vacating date around June 12. Therefore, it is clear that this nest was vandalized in some manner."

It is a pity that neither one of the two nests was successful. If anybody has any breeding record or sightings of this bird east of the Red River, I should be pleased to hear about them. —Norman Lee, RR No. 3, Selkirk, Manitoba.

## BIRD HOUSES

I now have 130 bird houses in position and 14 in the basement awaiting erection. The houses are occupied by Eastern Bluebirds, House Wrens or Tree Swallows. My best area is 60 miles northwest of Toronto.

Dennis Barry has over 600 boxes in the area north and northeast of Oshawa. Mrs. Hazel Bird of Harwood has 440 boxes up and reckons on 214 units housing successful broods.

Mrs. Bird's boxes are always seven feet off the ground. My boxes are doing well at 9, 10 or even 15 feet. Mrs. Bird uses tin cans up the 2 x 2 post and reports no losses to cats for three seasons. Her houses are made from the wood from old barns. I have adopted her ideas but I use new western red cedar, a front door that battens down securely and a galvanised

tube called a three-inch down pipe in the plumbing trade. She gets no vandalism but the stupid acts of destruction in some of my areas would make your hair curl if I related them to you.—L. A. Smith, 133 Madison Ave., Toronto 5.



Photo by L. A. Smith

Mrs. L. Kaye, Toronto Field Naturalist club, and bird house erected in Mono Township, June, 1972.

## GOSHAWK

While visiting the Spruce Woods Park area on May 7, 1972, I spotted a large nest. On closer inspection, I found it to be occupied and the bird sitting well down in the nest. I approached the base of the tree in order to get a better look at it. The bird rose to a standing position and expressed its annoyance by uttering harsh screams. It was at this point that I discovered its identity—it was a Goshawk. It showed no inclination to fly from the nest. I read all available references to Goshawks in various bird books and also Bent's *Life histories of North American birds of prey*, and decided that this bird was not living



up to its reputation. On June 4, however, when I paid another visit, the Goshawk dive-bombed me three times before I made my escape.

Accompanied by Cleveland P. Grant of Mineral Point, Wisconsin, I visited the nest again on June 7. He confirmed my identification saying this was his best observation ever of a Goshawk. While watching from the car, we saw the Goshawk bring a green branch to the nest. Subsequently it flew away and returned three or four times. On June 25 and 26, July 1 and September 17, I paid further visits to the nest but did not see the Goshawk again. At no time did I see more than one bird nor did I see any fledglings. The nest was placed in the crotch of a trembling aspen at a height of 25 feet. The habitat was mixed deciduous and coniferous forest.—*Mrs. Barbara Robinson, Brandon.*

### PIGEON HAWK CATCHES BAT

Opposite our house in a residential district of Edmonton is a grassy park of about three city blocks in extent. There is a man-made hill in the centre near the base of which several dozen small spruce and birch trees have been planted. On our side of the park is the remnant of a farm windbreak, an L-shaped row of large poplars.

During early August of 1972 I twice saw a Merlin or Pigeon Hawk (*Falco columbarius*) fly toward these trees, carrying a House Sparrow. The little falcon perched to eat its prey on the dead top branches of the outer poplar. At about 3:00 p.m. on the warm and sunny afternoon of August 16, 1972, after a brief thundershower had passed over the area, I happened to see the merlin leave the tree at hunting speed. One hundred yards away it skimmed the top of the hill, disappeared momentarily from my view, and swooped up beyond it, turning back to the trees. It carried a small object, which I assumed to be another sparrow. I went into the house to get my scope, and set it up on the front steps, as I had done on previous occasions. It afforded

me a first-rate view of the feeding falcon. But this time little plucking was done and the merlin finished rather quickly. Through the scope I had seen a small object fall. I searched for it below the tree. It proved to be part of the wing of a bat.

The wing part was tentatively identified by H. C. Smith, Curator of Zoology at the Provincial Museum in Edmonton, as that of a little brown myotis (*Myotis lucifugus*). Dr. M. B. Fenton of Carleton University confirmed the identification.—*Dick Dekker, 3819 - 112A Street, Edmonton, Alberta.*

### THE ROYAL FALCON

When I was in Paris this past summer, a friend sent me an article by Fred Bruemmer that had been widely circulated through Canada in June in the *Weekend Magazine*. Bruemmer's story and photographs warned emphatically that extinction now threatens "the pride of princes," the falcon. He was of course writing especially about Gyr Falcon and the Peregrine, the two birds so highly prized for centuries by falconers. These birds constituted kings' ransoms in the Middle Ages, and they are unfortunately still being sought by oil-rich Middle East sheikhs who will pay as much as \$30,000 for a white Gyr Falcon.

Shortly after reading Bruemmer's article, I happened to be visiting the Egyptian antiquities gallery at the Louvre, where I was reminded of a much earlier chapter in the history of the falcon. There, in steles painted more than 2000 years before Christ, appear recognizable Peregrine Falcons with their characteristic beak and moustaches. The representation of the falcon in early Egyptian art took many forms, and I was fascinated to find the motif repeated over and over in little statuettes, medals and amulets in the collection. Like other animals, birds in Egyptian art usually represented gods, and hawk- or falcon-deities were sky-gods. The falcon represented the royal god Horus. One of





the typical steles in the collection in the Louvre, dating from about 1000 B.C., depicts the god with human body and characteristic falcon head, listening to his praises being celebrated on the harp by a court musician (see figure).

It is unthinkable that a bird that has been associated for so long with human civilization should be nearing the end of its life as a species. What can be done to save this ancient link with our cultural past? The first step must be to make people recognize the seriousness of the situation, and a magazine like the *Blue Jay* can play a role in this by publishing articles which draw attention to the threat to the falcons and seek out ways of meeting it.—Margaret Belcher, Regina.

### WHO SHOT GOLDIE?

It was a fine fall day in the Eagle Hills near Biggar, Saskatchewan. A Golden Eagle, hunting for his dinner, had just captured a field mouse which was promptly swallowed whole. Airborne again he was anxiously scanning the ground for the sight of some small animal when a volley of lead pellets

peppered his body. One wing and one leg fell useless. He went into a tail spin before the boom of the shotgun reached his ears. The earth seemed to move up toward him and they met with a jarring impact. The noble bird was a helpless cripple—it was not a fine day any more.

It looked like the end of the line for the eagle but a member of the Department of Natural Resources found the pitiful bundle of feathers and took it to the Small Animal Clinic in the Western College of Veterinary Medicine at the University of Saskatchewan at Saskatoon. The record reads: "Date admitted: October 31, 1971; name: Goldie; weight: 10 pounds approximately; age and sex: not determined; ailment: fracture of the right wing and fracture of the radius and ulna of the left leg." Under the care of Dr. R. T. Dueland Goldie was found to be a cheerful and uncomplaining patient; in fact, he soon became quite friendly with his nurse. The menu listed such things as mice, white rats and an occasional bush rabbit.

On December 6, 1971 he was pronounced cured and released into the custody of the Department of Natural Resources who took him to Regina where a flying range was available for practice.



Goldie

Photo by V. J. Harper



I hope that by spring he was able to fly back up into the sky where he belongs. If you see him up there, please remember how easy it is to bring him down and how hard it is to put him back up.—(Mrs.) *Theresa Heuchert*, Box 21, Clavet.

### PILEATED WOODPECKER

I was interested in the item appearing on page 97 of the June, 1972, *Blue Jay*, concerning Pileated Woodpeckers. The authors speculated on the possibility of a range extension for the Pileated Woodpecker down the Red Deer River.

A Pileated Woodpecker nest was reported to me in June of 1972 by Mr. Tim Greenlee of Botha, Alberta. The nest was located in the Department of Highways campground along the Red Deer River, about 10 miles west of Big Valley, Alberta. Tim, Miss Carole Greenlee of Stettler, my wife Patricia and I drove to the campground on June 10, 1972, to observe the nest.

The nest was located in a large cottonwood tree about 25 feet above the ground in a mature stream-bank stand. The baby woodpeckers were heard chirping inside the nest-hole, and both the male and female adult Pileated Woodpeckers were seen entering and leaving the nest-hole on numerous occasions. Several photographs of the adult female were obtained.

This nesting record supports speculation of a range extension for the Pileated Woodpecker. — *Graeme M. Greenlee*, Edmonton.

### LAZULI BUNTING

On June 11, 1972, my husband and I observed through the kitchen window a bird we believed to be a male Lazuli Bunting. We do not consider ourselves bird watchers though we are interested observers. Upon sighting this bird I recalled reading of the Lazuli Bunting in the March issue of the *Blue Jay*, and immediately afterwards looked it up.

The bird was seen in our garden lilac bushes in Estevan. It was, we estimated, about four or four and one-half inches long with the stubby bill of a seed eater. It was a lovely bright blue, rather like a baby blue with white wing bars plainly seen. Its breast was a light pinkish brown. It hopped easily from branch to branch in the lilac bushes, possibly feeding on the new seeds, and was only in our full view about two minutes. Looking through the window we were only about 12 feet away.

At the time of the sighting, 9:45 a.m. that Sunday morning, the temperature was 71 degrees with scattered cloud and a south wind at five miles an hour.

I hope we will see the bird or possibly its mate again for more detailed observation, but by comparison with the black and white picture in the March *Blue Jay*, we felt there was a good chance that this was a Lazuli Bunting.—*Mrs. Gillian Sernich*, Estevan, Saskatchewan.

### OWL BANDING 1972

On the morning of May 14, 1972, Dr. S. Houston, with his three assistants, accompanied my father and me to our Great Horned Owl nest sites. Eleven young were banded out of eight nests and one infertile egg taken for analysis.

At one particular nest site a Red-tailed Hawk nest was situated 45 yards from the owl's nest. Finding two different species nesting so close together was very unusual. On June 27, Wayne Harris came out to band Red-tailed Hawk young. Upon visiting the site we saw that the nest had fallen down, the hawk nest had apparently been unsuccessful.

This spring my father and I found it very difficult to locate Great Horned Owl nests. We'd find a nest but there would be no evidence of young, although the parent owls were always found in the vicinity of the nest. When we climbed these trees, we found the nests to be empty. Dr. Houston said this was due to the cold weather we



had this spring. The change in temperature froze many eggs.

The decline of young owls is also due to the lack of rabbits. Rabbits make up a large part of the owl's diet. Once there is a decline in the population of the most important food of any animal, the species of animal gets just as scarce as its prey. From 1967 to 1970 there was an average of four young to a nest. In the past two years, there has been a decline in young, averaging two young to a nest.

I heard that it takes seven years for the rabbits to become as numerous as they once were. If this is true, I think there will be a decline in the production of young Great Horned Owls for the coming years.

Next year I hope the Great Horned Owls will be more successful in producing their young. — *Rosemary Nemeth* (age 16), Yellow Creek, Saskatchewan.

### CATBIRD

I took this photograph of a Catbird on July 14, 1972. The bird, one of an almost identical pair, fitted the des-

cription of a Catbird exactly according to *A Field Guide to Western Birds* by Roger Tory Peterson. I noticed, as did my father, the chestnut under-tail coverts (seldom seen). Not seen in the photograph are the four blue-green eggs which the bird is sitting on.

The Catbirds built their nest about five feet off the ground in a *Caragana* hedge in a quiet corner of the garden. I think this is unusual because I have been told that the Catbird rarely comes into town.

The photograph was taken at approximately 10:30 p.m. in the dark using an electronic flash unit.—*Rupert C. James*, Unity, Saskatchewan.

### MOCKINGBIRD

A pair of mockingbirds are with us this summer, nesting in a spruce tree in our evergreen grove. We have been highly entertained by the male and his beautiful mimicking song. Several nights we have heard him singing all night long. One early morning we taped part of his vocabulary and my husband decided to play it back to him. This proved to be very puzzling



Photo by Rupert C. James

Catbird, 10:30 p.m., July 14, 1972



to the mocker, and his antics in trying to solve the source of the sound were interesting to observe.

At this time [July 22, 1972], the male bird has stopped singing as he is busy feeding the nestlings. We see both parent birds flying in and out of the spruce tree. (We happen to have a heavy infestation of grasshoppers and apparently the birds are feeding them to their young.)

Incidentally, this summer we have seen 35 species of birds in our farm yard.—*Mrs. Vern Nordal, Bulyea.*

### INDIAN PIPE

Every year in late July or early August I visit a certain spruce grove along the shore of Loon Lake to see the flowering of the Indian Pipe (*Monotropa uniflora*). It is well worth the rough tramp through the woods to see the delicate beauty of these flowers in their natural setting.

The Indian Pipe is found in damp spruce or poplar woods. It is a saprophyte, feeding on decaying vegetation. The whole plant is waxy white, almost transparent. The only color is the yellow of the stamens. It looks quite fragile, but really is tough. There may be as many as 20 flowers in a cluster.

When the flowers first open, they are nodding and look like tiny pipes. Later they straighten up and the whole plant becomes dark brown or almost black. The stiff stems and seed capsules may still be found the following year.—*Mrs. H. D. Bobier, Rapid View, Saskatchewan.*

### RED-HEADED WOODPECKER

I have been told that the Red-headed Woodpecker was not often seen in Saskatchewan but on June 4 I observed one for a whole afternoon. It stayed between four telephone poles the nearest one being about 50 yards from the house. It was feeding the whole time so I presumed it was migrating and, sure enough, it was not there the next day. I could see its markings really well and in some lights its color showed blue black. It clung to the pole, swooped down to catch insects and then flew right back to the pole.—*Mrs. Ivy Schwartz, Melfort.*

### BIRDS AND MAMMALS

On June 11, 1972, at 11 a.m. I watched from about 10 feet away how a common flicker on a brick patio cleaned out each ant hole as it came to it. It was not nearly so nervous as the sparrows and I even managed to get outside to observe its work.

Also, a neighbor on a nearby farm is praising the work of the birds this year. He has observed a flock of magpies as well as a Great Blue Heron feeding on grasshoppers.

I should also like to report that in this area we have had a large increase in red fox and raccoons, an increase which we think is due to the killing of too many coyotes.—*W. Keith Kenderdine, Scarth, Manitoba.*



Indian Pipe



## WOLVERINE

Ten days ago [about July 12, 1972], while in the half-ton I noticed an animal about one-quarter mile away on hayland that had been swathed. At first I thought it was a dog and then I realized it was not. It was 2 o'clock in the afternoon and I said to myself that it was either a beaver or a wolverine. I finally decided it must be a wolverine as it travelled quite fast and as soon as I made toward it, it headed for a large slough full of cattails but little water. I am completely familiar with beaver and am practically sure that the animal was not a beaver but as I have lived here for 53 years of my grown life and have never seen or heard of a wolverine in the vicinity, I didn't tell many people of my sighting.

Now I find that a neighbour, Fred Gravener, was driving at night about the same date and saw an animal he took for a wolverine on the road, an animal which travelled quite fast. The animal I saw had a peculiar galloping gait and a high or arched back. These two unrelated incidents make me about 95 per cent sure that I had, indeed, seen a wolverine. If so, it is about 300 miles away from its usual haunt.

I hope that the animal may reach Moose Mountain Park (about 20 miles away), a spot where it possibly can survive.

If any other people have seen such an animal, I should be glad to hear from them.—*G. M. Hewson, Langbank.*

## THIRTEEN-LINED GROUND SQUIRREL

On June 19, 1972 I observed something I had never seen before—a female thirteen-lined ground squirrel (of which we have quite a number around) moving her young. She would dash around to the back of the house and in a minute or two return carrying her baby by the neck. I watched as she brought five babies and deposited them down a hole just in front of the house. Later I went to

look at the hole and had difficulty finding it as she had filled it in and even had cleverly placed grass across it. The babies were about three to four inches long and already had the stripes in their fur. I thought it all very interesting.

I enjoyed the summer meet at the Battlefords and only wish that there were two of these outings a year.—*Mrs. Ivy Schwartz, Melfort.*

## OSPREY CONFERENCE

A first conference on the status of the North American Osprey was held in mid-February at the College of William and Mary, Williamsburg, Virginia, where Dr. Mitchell A. Byrd, head of the Biology Department, presided as host and resident chairman. The speakers were all concerned and active workers in osprey survival studies. Their ranks revealed a wide spectrum of backgrounds and occupations, reflecting governmental, scholastic, amateur and professional interest.

At the conclusions of the sessions, the participants elected an American Osprey Committee from five general regions of the United States to publish the proceedings; to implement the aims and activities of the group; to seek Federal cooperation in promotion of direct and indirect protective measures for the species; and to stand to serve in an advisory capacity to the Bureau of Sport Fisheries and Wildlife with respect to future work on this species. It is expected that at a later date two representatives from Canada will be invited to serve, as well.

Individuals or institutions wishing to receive a copy of the paper-bound, published *Proceedings of the First North American Osprey Research Conference* may do so by writing to Dr. M. A. Byrd, Dept. of Biology, College of William and Mary, Williamsburg, Va. 23185. Sale price is expected to be no more than \$2.00. Requests of copies need not be accompanied by prepayment.—*G. F. Fernandez, Box 53, Dartmouth, Mass.*



## POPULATION POLICY

The following quotation from Robert Audry was printed, page 241, October, 1972, *Reader's Digest*. "If our most treasured democratic institutions are to be preserved . . . then birth control must be compulsory. As one man, poor or rich, cannot be granted the privilege of more than one vote, as one man, of whatever status, cannot be granted the privilege of driving through a red light at 70 m.p.h., as one man cannot be sent to prison for a crime for which another man is free, so one human being cannot be granted the privilege of burdening society with more than a fair share of young." This is exactly what I would like to have said at the Annual Meeting when we were debating the resolution on a Canadian population policy. Please reprint the quotation in the next *Blue Jay*.—*Hazel Paton, Oxbow, Saskatchewan.*

## SNOWMOBILES

**Ed. Note:** The following is a copy of a letter sent November 7, 1972 to Hon. T. Bowerman, Minister of Natural Resources, Administration Building, Regina. Mr. Schondelmeier has taken a strong stand against harassment of wildlife by snowmobilers.

Dear Sir:

Last winter I wrote to the Dept. of Natural Resources regarding hunting with snowmobiles, but did not get much satisfaction. I think most people in Saskatchewan are opposed to this practice but still it continues. As it is now almost anyone can go to the R.M. and get a permit to hunt foxes and coyotes by snowmobile, the result being that during the winter wildlife just has no place to go anymore. Any land with a few bluffs on it is being criss-crossed hundreds of times during the winter driving all wildlife out into the open.

Around here there are usually three or four snowmobiles in a group and any fox or coyote they see just hasn't a chance in the world. And, of course, every fence they come to is

usually cut or put down too. Before permits were issued these people had a little respect for private property, but now armed with a permit they seem to think they have the right to go anywhere.

I've been farming here for 25 years and have yet to lose a chicken to foxes or coyotes, and we've had as many as three dens of foxes within half a mile of the yard. If they do become so numerous as to cause problems, they can always be shot, so there's no need to run them down with machines.

Last winter the coyotes and foxes were hunted almost to extinction around here, the result being that this summer we had more mice and pocket gophers than ever before. Now, I'm not against hunting, but using high speed machines to run animals down is something that should be discouraged. Instead of permits being issued, heavy fines should be imposed on the offenders.

I certainly hope that something will be done to stop this senseless method of hunting.

Yours truly,  
A. Schondelmeier

## CORRECTION

Two errors appear on page 111 in the June 1972 *Blue Jay* in my article "Sound production in the courtships of two Lycopsid spiders." The caption for Fig. 2 should read, *Schizocosa avida*. A single strum. 10msec. per square. The caption for Fig. 3 should be *Tarentula aculeata*. Two consecutive impacts of spider's abdomen on substratum. 50 msec. per square.—*Donald J. Buckle, 2010 Lorne Ave., Saskatoon.*

## NEST RECORD CARDS

Please send 1972 Prairie Nest Record Cards in to Mr. H. W. R. Copland, Manitoba Museum of Man and Nature, 190 Rupert Avenue, Winnipeg, Manitoba, R3B 0N2, as soon as possible. A report for 1972 can then be prepared.



## MISSING DOCUMENTS

The Historical Branch of the City of Edmonton Parks and Recreation Department has been researching information about the Hudson's Bay Company, Fort Edmonton as it was during the 1840's, in preparation for an authentic reconstruction of the post. Much of our knowledge of this fort in the 19th century is derived from Fort Edmonton Journals of Daily Occurrences which are now in the Hudson's Bay Company Archives. Unfortunately, all of the Journals between the years 1834 and 1854 are missing, but it is possible that they still exist somewhere, perhaps in a private collection.

If any readers have information concerning the whereabouts of these missing journals, we would sincerely appreciate hearing from them.—*Doug Babcock*, The Historical Exhibits Building 10105-112 Avenue, Edmonton, Alberta T5G 0H1.

## CANVASBACK

The United States Department of the Interior News Release of August 31, 1972, explains that the complete closure of the Canvasback hunting season in the United States in 1972 is due to the precipitous population decline from about 2,000,000 in the late 1950's to fewer than 1,000,000 now.

The Fish and Wildlife Service has allotted \$200,000 to an expanded research program on Canvasbacks which will attempt to determine the reasons for the population decline. The release claims that the decline has taken place despite improved habitat conditions in the prairie pothole region of Canada where the majority of the Canvasback breed. They will, therefore, look for causes elsewhere, but under the circumstances Canadians should certainly examine the availability and health of Canvasback habitat.

Since there are fewer than 1,000,000 Canvasback and since there are nearly 3,000,000 waterfowl hunters in the United States, it is obvious that there must be strict control of hunting and that the same closure should apply in Canada.—Editor.

December, 1972

## 1972 CONSERVATION AWARD

At the SNHS annual meeting in Regina, October 14, 1972, the president, Mr. J. A. Wedgwood, presented the 1972 Conservation Award to Miss Christine Pike of Waseca, Saskatchewan. The society's conservation award is "presented annually to a person who has made a significant contribution to conservation in the province of Saskatchewan."

Miss Pike, since girlhood, has envisioned Big Gully Creek at its confluence with the valley of the North Saskatchewan River as a place of wild natural beauty which should be retained forever. For years she has pressed towards her goal—a sanctuary on Big Gully Creek. The society now has a lease on Big Gully Creek, but this is only the first stage, for our lease guarantees that the area will be preserved in its natural state only while we hold the lease. The final dream will be realized when Miss Pike obtains complete sanctuary status for the area.

## CLIFF SHAW AWARD

Each year since the death of Cliff Shaw in 1959 the SNHS has given the Cliff Shaw Award to the person or persons contributing the best item to the *Blue Jay* since the preceding annual meeting. This year the award was presented to Harold W. Pinel and Clifford A. Wallis, University students at the University of Calgary. In the March, 1972, *Blue Jay* they had reported an "Unusual nesting record of Red-tailed Hawk in southern Alberta" and in the September issue had contributed a 26-page report—"A botanical investigation in the Drumheller area, Alberta." In presenting the award to Clifford Wallis who had attended the annual meeting the editor thanked the two recipients of the award for the excellently prepared papers which they had contributed to the *Blue Jay*. The editor praised Pinel and Wallis for their wide interest in natural history and expressed the hope that the *Blue Jay* would continue to receive the results of serious studies from them.



# SASKATCHEWAN NATURAL HISTORY SOCIETY

## FINANCIAL STATEMENT — YEAR ENDING SEPTEMBER 30, 1972

### INCOME

Memberships (including sales of <i>Blue Jay</i> ) .....	\$ 5,837.35	
Memberships (extra re supporting and sustaining) .....	1,411.27	\$ 7,248.62
Spec. Pub. No. 1 — Guide to Sask. Mammals .....	50.95	
Spec. Pub. No. 2 — Birds of Sask. River .....	101.45	
Spec. Pub. No. 3 — Birds of Regina .....	84.70	
Spec. Pub. No. 4 — Blue Jay Index .....	12.00	
Spec. Pub. No. 5 — Birds of Lake Athabasca .....	52.00	
Spec. Pub. No. 6 — Birds of Northeastern Sask. ..	39.14	
Spec. Pub. No. 7 — Birds of Moose Mountain .....	377.12	
Publication — Birds of the Elbow .....	8.56	
Donations: General .....	600.49	
1971 Annual Meeting — Moose Jaw (net) .....	15.65	
1972 Summer Meeting — N. Battleford (net) .....	81.57	
Interest (bank accounts and bonds) .....	315.86	
Bookshop net profit (14.5% of sales) .....	668.99	2,408.48
		\$ 9,657.10

### EXPENSE

Printing of <i>Blue Jay</i> (4 issues) .....	\$ 6,213.28	
Newsletter (3 issues) and Brochure .....	721.91	
Honoraria .....	335.01	
Postage .....	366.83	
Office equipment (½ addressograph and cards) ....	542.72	
Bank charges plus U.S. premium .....	2.43	
Affiliation fees .....	40.00	
Miscellaneous office expenses (incl. stationery) .....	265.00	
Printing of Birds of Moose Mountain .....	970.45	
Grant to Canadian Nature Federation .....	500.00	
Delegates to meetings .....	420.99	10,378.62
EXCESS OF EXPENDITURE OVER INCOME .....		\$ 721.52

## STATEMENT OF ASSETS AND LIABILITIES AS AT SEPTEMBER 30, 1972

### ASSETS

Cash on hand (Bookshop) .....		\$ 40.00
Cash in bank (chequing)—(\$3,241.46, 499.44) .....	\$ 3,740.90	
Cash in bank (savings)—(\$1,252.18, 5.32) .....	1,257.50	4,998.40
Canada Savings bonds, plus accrued interest .....		5,337.50
Stock on hand (Bookshop) .....		935.63
Office equipment (less \$542.72 depreciation) .....		542.72
Accounts receivable (less prepaid orders) .....		289.60
Deposit with Postal Department .....		67.99
Internal adjustment .....		4.22
Bal. of publication subsidy re: Hours and the Birds ..	340.60	
Less royalties and local profit during past year ..	369.65	(29.05)
		\$12,187.01

### LIABILITIES

Trust Fund re: Sanctuaries and Conservation areas		
Balance at September 30, 1971 .....		\$ 1,385.27
Plus donations during past year .....		47.00
Plus donation in memory of Lloyd Carmichael .....		10.00
Big Gully sanctuary — 1972 lease and taxes .....	\$ 440.07	
Donation re: 1971 and 1972 expenses .....	640.00	199.93
Printcraft Ltd. (September <i>Blue Jay</i> ) .....		1,571.01
Education tax .....		19.60
		3,232.81

### NET WORTH

Balance at September 30, 1971 .....	9,675.72	
Less deficit for year ending September 30, 1972 ....	721.52	8,954.20
		\$12,187.01



# THE SASKATCHEWAN NATURAL HISTORY SOCIETY

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## THE BLUE JAY (to December 31, 1972, only)

Blue Jay Editor, George F. Ledingham; Assistant Editors, Robert W. Nero, J. Stan Rowe and Richard Fyfe.

All items for publication in future issues should be addressed to J. B. Gollop, 2202 York Avenue, Saskatoon.

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The classes of memberships in the SNHS are as follows: *Regular*, \$3.00; *Supporting* \$5.00; *Sustaining* \$10.00. Supporting and sustaining memberships include the regular membership fee plus a donation for which a receipt is available for income tax purposes, upon request. Bulk orders (minimum of five to one address) are available to junior club members and to educational institutions at the rate of \$3.00 for the first subscription and \$1.00 for each additional one.

Send all renewals and new memberships to THE TREASURER, SNHS, Box 1321, Regina, Saskatchewan. (Note: Bookshop orders and general inquiries should be sent to Box 1121).

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